

Airlines Dig Up Models to Cope With Fuel Cuts

By Jay Woodruff
CW Staff

NEWTON, Mass. — Fuel cutbacks by suppliers, distribution problems and rising prices caused airlines to cancel flights last week and either dust off fuel allocation programs that many hadn't used since the 1973-74 oil embargo or reorient existing flight planning models.

Cuts were announced daily throughout the week, with United Airlines, at press time, announcing the most — 424 flights, or 3.4% of its 12,000 weekly flights.

Most airlines claimed to use some sort of

computer-aided planning to make the most efficient use of available fuel, but the ability of their systems to cope with a fuel shortage varies.

IBM's Mathematics Problem Solver — Extended (MPSX), which is run in batch, is used by most airlines.

Spotlight on Scarcity

Ironically, however, some of the most sophisticated models address virtually every aspect of flight planning except fuel scarcity, according to National Airlines' Duane Darnell. That carrier's Fuel Management Al-

location Model, put into operation in 1973, is the only system to deal with fuel scarcity as part of the program, he claimed.

National was the first airline to use linear programming to address fuel shortages in planning, Darnell said. The model specifies for each flight the best vendor and location to pick up fuel, based on availability, fuel cost, flight data, the amount of fuel burned in flight and the cost of carrying extra fuel.

"The others do not have a scarcity formula built into their systems. They optimize (Continued on Page 6)

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Magnuson Introductions Keep 4300 Pot Boiling

By E. Drake Lundell Jr.
CW Staff

SANTA CLARA, Calif. — The pot continued to boil last week in reaction to IBM's 4300 series as Magnuson Systems Corp. introduced three systems bracketing the 4341 in performance and upgraded its previous M80 models 3 and 4 while cutting their prices.

With the new systems, Magnuson now offers alternatives to the entire mid-range IBM line, from the 370/138 to the bottom of the 370/158 class, company officials said here.

All of the units can run present IBM operating systems including the upgrades announced for the 4300, according to Magnuson, which added that it would implement firmware to handle the assist functions announced with the IBM units.

At the same time, Magnuson said it would continue to offer its users completely bundled operating systems and maintenance support, even though IBM has begun to charge for operating

(Continued on Page 6)

IBM Offers Trade-In Deal Cutting 158 Lease in Half

By E. Drake Lundell Jr.
CW Staff

WHITE PLAINS, N.Y. — Users of IBM 370/158s can effectively cut their monthly lease bills at least in half with a trade-in policy announced by the firm recently.

Under the plan, which has been described as a "disguised price cut," IBM is offering a guaranteed trade-in price to users who presently rent or lease a 370/158 if they purchase their systems by April 30. The trade-in allowance ranges between 14.5% and 20% of the system's list price, IBM said, but users must return their systems between Jan. 1, 1981 and Dec. 31, 1981.

The percentages run on a sliding scale from

20% for a January 1981 trade-in to the 14.5% allowance on a December 1981 trade-in.

The trade-in allowances can only be applied to new IBM purchases and the users can not get cash back for their systems when they trade them in.

IBM would not say how it plans to use the returned 158s. However, several industry observers noted that the units might be repackaged as parts of new systems.

For example, the channel director on IBM's 3033 computer system today is just a repackaged 158, one observer pointed out.

Previously IBM had not offered such high allowances on machines and usually negotiated much lower trade-in allowances on a case-by-case basis, except for a similar program for 360/50s last year, which had little effect on the industry.

On the 360/50 trade-in program, IBM offered users who purchased those systems between June 21 and Dec. 31, 1978 \$30,000 off the purchase price of a 370/115 through 370/148. Those Model 50s have to be returned to IBM by March 31.

Like a Discount Scheme

The latest policy works like a discount scheme because users can save a great deal of what they are currently paying in lease prices if they take advantage of it.

(Continued on Page 4)

Freeze on IMS Updates Predicted

By Jeffrey Beeler

CW West Coast Bureau

SAN FRANCISCO — Within the next six to nine months, IBM is likely to announce a freeze on its Information Management System (IMS) data base management system (DBMS) as a prelude to the introduction of an alternative product, probably a relational DBMS, consultant Stephen L. Robinson predicted here last week.

This move would be a severe blow to current users and would virtually "cut [them] off at the knees," Robinson warned at the Infotech International, Inc. conference on "IBM: The Next Five Years," held here last week.

Much of the trouble that a DBMS announcement might create for IMS users would stem from the IMS freeze that would almost certainly precede or accompany the product introduction. Under such a freeze, IBM would probably limit IMS support for its existing systems and remove the support entirely for future systems like the anticipated H series CPUs, according to Robinson, who heads his own consulting firm, S.L. Robinson & Associates. Thus, IMS users who want to up-

grade to IBM's next mainframe generation would have to convert to a new DBMS scheme. Such a conversion would throw IMS users into disarray, but the resulting dislocation probably would not deflect IBM from its intended course.

"IBM has done things like this before to its users," Robinson observed, "so we shouldn't be surprised if IBM does it again."

To explain why the firm might want

to change its DBMS software in the first place, Robinson pointed to IMS' generally poor reputation among IBM's users. Because of its complexity, few customers who have acquired the system currently use it and even fewer users have reported successful implementation.

As a result, the consultant speculated, IMS has probably become a source of embarrassment to IBM. To

(Continued on Page 8)

NCR Haggling Over 'Fixed Price' Gear

By E. Drake Lundell Jr.
CW Staff

DAYTON, Ohio — NCR Corp. users who do not look at alternatives for memory and disk upgrades may be paying prices higher than those the firm charges users who do look at alternatives.

Several users last week confirmed that NCR has cut its bids on such equipment when faced with competition, and *Computerworld* has obtained an internal NCR memo spelling out that policy. NCR refused to comment.

"In response to competition [sic] quotations on Century or Criterion memory, we are at the present time countering these quotes provided a copy of the vendor's quotation is submitted," NCR vice-president Gilbert P. Williamson wrote to the firm's Sacramento, Calif., district manager.

"In the event a copy of the quote is not available, a letter from the customer stating the name of the vendor, the increment of memory and the pricing quoted may be substituted," the memo, dated Dec. 20, 1978, added.

However, the memo did state that while NCR would make counterproposals to competitors' offerings, "in no case will NCR reduce prices to an amount lower than or equal to that quoted by the competitor."

Several users — who asked not to be identified — told CW last week the NCR policy had been carried out in the field when they were considering memory upgrades.

And one competitor, Computer Enhancement Corp. in Costa Mesa, Cal.

(Continued on Page 8)



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Kardios Plans \$70,000 Model of PE 3220 With 4341 Throughput, 370 Compatibility

By Brad Schultz

CW Staff

GAITHERSBURG, Md. — A \$70,000 version of Perkin-Elmer Corp.'s (PE) 3220 supermini was announced last week, described as matching the throughput of IBM's 4341 mainframe and offering full IBM 370 compatibility.

Deliveries of the Duo 70-E will start in July.

Kardios Systems Corp. created the

system by enhancing the 3220's firmware to run IBM code and accept IBM peripherals under PE's multi-tasking OS/32 operating system. The Duo 70-E includes PE's 1M-byte main memory, 1K-byte cache memory, error logger and CRT console, a Kardios spokesman said.

With the 3220's 8M byte/sec direct memory access bandwidth, the Duo 70-E delivers three times the throughput of IBM's 4331 system, he

claimed. The 4331's bandwidth is reportedly 512K byte/sec.

However, Kardios has not yet compared the times required by the 4300s to execute given routines against the times needed by the 70-E, the spokesman admitted. Instead, the throughput claims are extrapolated from times recorded for the Duo 70 — another firmware rewrite based on PE's (formerly Interdata's) 7/32 supermini that Kardios introduced in 1977 to compete with IBM's 370/138 [CW, July 18, 1977].

In fact, Kardios does not yet have a 3220 because PE has not started to deliver the system, a PE spokesman confirmed. However, the systems house said it stands ready to take processors as they are introduced by PE's Computer Systems Division, modify the firmware to permit IBM compatibility and market them.

Hence, unlike the 3220 from PE, the Duo 70-E can execute routines written in IBM assembler, Cobol, Fortran, PL/I "and all other standard [IBM] compilers," the spokesman stated.

While none of IBM's operating systems will support the Duo 70-E, PE's OS/32 will handle up to 32 background memory partitions and 255 foreground tasks, the spokesman continued.

Aside from the IBM compatibility, the Kardios system offers essentially the same capabilities as the 3220, which debuted as the first of PE's projected 3200 series of superminis just three weeks ago [CW, Feb. 19].

PE has agreed to install and maintain the Duo 70-E via its standard maintenance agreements.

Kardios is located at 26 N. Summit St., Gaithersburg, Md. 20760.

Intel 'Microfast' Boosts 370/145 Into 148 Range

By Don Leavitt

CW Staff

SAN FRANCISCO — Microfast/VS1 Assist, a microcode-based enhancement package introduced last week by Intel Corp., provides a 10% to 15% performance improvement for IBM 370/145s running under OS/VS1, a spokesman claimed.

Microfast is functionally equivalent to the VS1 Assist portion of IBM's 370/148 Extended Control Program Support (ECP5), he said. Its main function is to reduce the time needed to perform certain often-used system routines contained in the Model 145's operating system.

The package is self-contained and resides in the CPU's main memory beyond the microcode supplied by IBM. Therefore no hardware changes are needed and there is no interference with the machine's normal microcode, Intel asserted.

Going into detail, the vendor said the major functional areas treated by Microfast are storage management, page

management, IOS, SVC, FLIH and Channel Control Word (CCW) translation.

Benchmarks showed a 10% improvement in elapsed time and a decrease in CPU usage when Microfast was used to compile and execute a typical jobstream. When Microfast assisted in increasing the CCW translation speed and improving channel activity of I/O-bound CPUs, the CPU — being less heavily committed to system overhead — was able to execute the I/O instructions faster.

Intel said the advantages to be gained from using Microfast will include reduced Supervisor state time, additional problem state time, lower CPU usage and increased channel utilization.

Microfast is ready for immediate delivery as an IPL tape customized for each CPU. It is loaded during Initial Microprogram Load (IMPL).

The software is available for a minimum monthly rental cost of \$500, Intel said from One Embarcadero Center, San Francisco, Calif. 94111.

On the Inside This Week

NEWS

EDS Files \$21 Million Lawsuit Against Iran, Intel	4
Iran Probing EDS for Corruption, Memo Shows	5
World Cup Competitors Ski Against System	7
He Profits From Bank's Key Punch Error After All	8
Loss of Control Cited as Consumer Fear of EFT	9
IBMer Defends '64 Release of Bug-Ridden 360s	10
Diebold Withdraws from U.S. vs. IBM Trial	11
GSA May Let Agencies Get Own DP Gear	12
Expo '79 Opening Tomorrow at N.Y. Coliseum	13
California DP Crime Bill Delayed for Redraft	14
No More Help for Soviets, 2,400 Scientists Say	15
Jaycees Name Felon Man of Year for DP Work	16

EDITORIAL

Editorial: A Call for Publicity	24
Editorial on IBM 4300 Flawed by Bad News	25
'The Consultant' Shows Anything Possible	25
Taylor Report: A/R System Hits Errors	25
Human Connection: Debate on Job Standards	25
Edpaf Project Developing Base for DP Audit	26
Auditors Need More Than DP Grounding	27

SOFTWARE & SERVICES

Center Offers Software Project Data	33
Remote CPU-to-CPU Link Enhanced in DTSS	34
Audit Facilities Tied to 'DYL-260' Logic	37
Software Physics Tunes Medical Claim System	40
Lessors Extend DOS Aid to Include DOS/VS	42
RCS Facilities Smooth Cruise Line Operations	43
'Microsim' Uses PDP-11 to Build Micro Programs	46

COMMUNICATIONS

Multinational Nets Top Moving Execs	47
Front-End Processor Gives 360/65 Longer Life	50
DG Printers Incorporate 1,000-Word Buffers	54
Interface Option Links Text Editors and CPU	55
NCR Adds Terminals for Factory Applications	56

SYSTEMS & PERIPHERALS

Management Inputs Operation Ideas	59
Enhancements Ease Megraphic 7000 Graphics	60
Professor Building Net With 10,000 Nodes	63
On-Line System Paces Production to Demand	68

MINIWORLD

PCC Simplifies Group Code Recording	69
Controller Ties PDP-11, TU10/TM11 Systems	70
Mini Helps Native Americans Manage Land	73
High-Density Memory Compatible With PDP-8/A	75
Dick Boosts Throughput 40%	78

MICROCOMPUTING

School Boasts First Training Marathon	79
Aim 16 Linked to Commodore Pet	80

COMPUTER INDUSTRY

Soviet Chips Seen Ahead of Reports	81
Government Asks to Respond to IBM Blast	81
Falco Leaving Lear Siegler to Take Infoton Reins	82
AM Gets Contract From SBS	83
Renegotiation Board Pleads for Longer Life	84
At Annual Meeting, HP Accents New Product	86
GA Lays Off 100 in 'Overhead Cleanup'	87



Ohio Medical Indemnity
evaluates software...

Selects ADR's ROSCOE, LOOK and The LIBRARIAN.

Sorry about that, IBM.

ROSCOE selected over TSO and VSPC.

"When we converted from DOS to VS1, we wanted a replacement for CMS," explained Joe Petras, Technical Support Manager (left). "We couldn't use TSO because it wasn't supported on VS1. So we evaluated IBM's VSPC against ROSCOE and concluded that ROSCOE was by far the better product for our program development.

"Even though we've now converted to MVS and could switch to TSO, our programmers are very happy with ROSCOE and don't want to change. Besides, TSO would utilize about 24% of the CPU's capacity. The entire ROSCOE system uses only 4-6% of total CPU. We now do almost everything in the systems area through ROSCOE.

Compared to our card environment, we see a probable productivity gain of 50-60%."

ROSCOE speeds MVS conversion.

Gary Hall, Director of the company's Data Center (right), commented: "IBM and others indicated that conversion from VS1 to OS/MVS would take from 3-6 months. Using ROSCOE, we converted in record time—six weeks."

LOOK tunes MVS system.

"We evaluated several performance monitors and concluded that LOOK was best suited for our needs," Mr. Petras said. "It gives us valuable information while using very little CPU."

"During our conversion to MVS, we used LOOK heavily to tune the system. Without LOOK, it would have been nearly im-

possible," added Mr. Hall. "We use it constantly to examine our environment—to improve response time and to evaluate requests for additional hardware and memory."

The LIBRARIAN pays for itself in six months.

"We've been able to put our libraries on 30 cylinders instead of 150," commented Mr. Hall. "And we no longer have to compress our test library. The LIBRARIAN should justify its cost in six months."

Ohio Medical Indemnity, Worthington, Ohio, is the fifth largest Blue Shield Plan in the U.S. It pays over 14000 medical claims a day and answers thousands of subscriber information requests, 90% of them on the spot. Ohio Medical Indemnity has built a state-of-the-art data center. In only six years the company has moved from an IBM 360/30, through a 370/135, /145 and /158, and has just installed IBM's newest generation computer, the 3032.

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Wants Equipment Delivery Blocked

EDS Files \$21 Million Suit Against Iran and IteI

By Brad Schultz
CW Staff

DALLAS — Electronic Data Systems Corp. (EDS) has filed suit against the government of Iran and IteI Corp. The suit charges Iran with breach of contract and failure to pay for services rendered and asks for punitive damages for Iran's failure to protect EDS employees during the recent rioting and social unrest.

Filed in U.S. district court here, the \$21 million suit asks the court to block the delivery of IteI computer equipment purchased by Iran, but not yet shipped from a warehouse in England.

EDS apparently is seeking recovery of this asset as the only way it can be even partly compensated in this claim. The government of Iran does not have sufficient assets in the U.S. subject to U.S. courts to satisfy EDS' demands, the complaint pointed out.

No charges were made in the complaint against IteI, which was named as an "innocent party," an IteI spokesman said.

Named as defendants in the suit along with IteI and the Iranian government are Iran's Ministry of Health and Welfare (MHW) and Social Security Organization (SSO), which is a component of MHW.

The suit grew out of a three-year

contract under which EDS was to install and operate DP services supporting Iran's national health insurance and social welfare programs. EDS maintained it fulfilled its part of the contract.

The suit followed the recent commando-style rescue of two EDS engineers from Tehran's notorious Gasre Prison. The rescue was organized and financed by EDS Chairman H. Ross Perot. The two employees had been arrested and imprisoned by Iranian authorities as the facilities management firm hurriedly pulled out of that war-torn country [CW, Feb. 26].

Suit Details Losses

EDS contended it has lost \$13,477,606 in payments the Iranian agencies have so far failed to make. The firm also said it lost \$438,479 in "rebilled expenses due under the contract" and \$1,489,900 in "expenses of relocation of expatriate employees and termination of Iranian employees due under the contract."

The firm lost another \$2,817,519 in profits that would have resulted from the remaining period of the contract and \$250,000 in property damages, according to the complaint.

Services Provided

EDS claimed it implemented "a fully automated claims processing system for health care claims in Iran which, during the first five months of 1978, was utilized by [MHW] to process over 2,600,000 separate claims for physicians and hospital services provided to 1,600,000 eligible recipient patients."

EDS also said it automated the issuance of social security identity cards; designed and developed pilot operations for a social security regis-

tration system; and designed and developed social security income and benefit systems.

The SSO contract compelled EDS to hire or reassign personnel in the U.S. to work overseas and required SSO to expedite the issuance of visas and customs clearances to such personnel and to provide them with "appropriate working conditions," according to the complaint.

"EDS fully performed its obligations under that contract throughout its duration, transferring approximately 150 American data processing experts to Iran and training a data preparation facility staff of more than 275 Iranians for that purpose," the suit maintained.

"A dramatic escalation of social unrest in Iran" that began during the spring of 1978 caused EDS to become "seriously concerned about the ability of [SSO and MHW] to provide a secure working environment for EDS employees," the complaint stated.

"To a significant extent, the rioting and violence has proceeded from anti-Western and particularly anti-American sentiment, and EDS personnel in Iran were subjected to threats of bodily harm and death at locations where they were performing services."

EDS representatives informed SSO and MHW officials at a meeting on Dec. 4 that EDS would not continue to perform its contracted services without payment of the overdue sums and "more effective measures to ensure the

safety of its employees," the document said.

Less than two weeks later, the firm formally notified SSO and MHW that the contract was terminated "by reason of breaches and defaults." According to a statement Perot made in Dallas last month, Iranian authorities seized Bill Gaylord and Paul Chiapparone on Dec. 28 and held the two EDS engineers for a \$12.75 million ransom to force the firm's return to Iran.

Perot said his employees were captured within 12 hours of the firm's announcement that it was leaving the country.

Freeze on Assets

The suit asks that MHW and SSO be directed to pay EDS more than \$20 million as actual damages and more than \$1 million as punitive or exemplary damages.

Though the Dallas federal court dismissed EDS' initial motion for an order to restrain IteI from delivering equipment already paid for by Iran, the court is willing to consider "without prejudice" any further application for such a restraint, according to Thomas W. Luce III of the Dallas law firm of Hughes and Hill, which is representing EDS in this action.

But the court granted a motion to forbid temporarily the removal of MHW or SSO assets from the U.S., Luce said. The term of the freeze on assets was reportedly extended last week.

IBM Offers Trade-In Deal

(Continued from Page 1)

vantage of the offer.

For example, the purchase price for a 2M-byte 370/158 is currently just about \$1.5 million. A user who has been leasing the unit for \$44,000 for 50 months is entitled to a purchase credit of 50% of the list price of the machine. If that user purchases the system now, it will cost \$750,000.

However, if the user physically returns the system to IBM in January 1981, 22 months away, IBM will allow him a credit of \$300,000 toward the purchase of a new system.

Therefore, the user will have spent \$450,000 for the use of the system for the 22-month period, or only about \$20,450 compared with IBM's best present lease price of \$44,255.

Industry sources last week indicated that many of the 370/158s in the field had been installed for close to the 50-month period, so the calculation of the purchase credit is realistic. IBM just 60 days ago allowed actual purchase credits of up to 50%, which previously had been set at a 36% maximum rate.

Upgrade Implied

Since the systems have to be physically returned to IBM during the 1981 time frame, the move raised many questions among industry observers last week.

Several noted that the announcement carries an implied promise to have a system available at the time to which the users can upgrade. "Users who opt for this plan will have to have somewhere to go when they trade in their machines," one source pointed out. "IBM can't just leave them hanging."

Other sources indicated the move may be an attempt on IBM's part to keep 370/158 users from turning to configurations made up of multiple 4341s, which they said is a developing trend evidenced in the orders IBM is receiving for the units.

This would keep the 158 users using their present systems until IBM has the lower end of the H series available for delivery, these sources said. It would take pressure off the high rate of 4300 orders that have poured in since that family was announced.

"Presently IBM has received orders for about 50,000 of the 4300 systems," one industry figure said. As a result, deliveries will stretch into the mid-1980s if IBM can't find a way to get some customers to defer installing those systems for a few years.

Effect on Used Market

The move will also have an effect on the used computer market, computer dealers predicted last week. The user market gets many of its systems from users who have high purchase options — the same users who will receive the maximum advantages from the new IBM policy.

This may well slow the flow of the used 158s to the market, the dealers predicted.

Furthermore, the dealers had been predicting a 1981 residual value for the 158 of about 25% of the IBM list price, but the new IBM residual is under that level.

This may mean IBM expects its H series announcements to have a greater impact on the market than had previously been expected, several dealers postulated last week.

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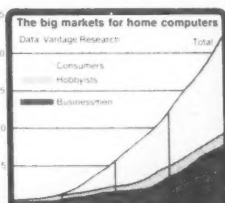
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Memo Shows Iran Probing EDS for Corruption

By Brad Schultz
CW Staff

WASHINGTON, D.C. — A memo circulated among Electronic Data Systems Corp. (EDS) officials here shows EDS pulled its personnel out of Iran while an Iranian prosecutor was trying to establish whether the firm was linked to high-level corruption in that country, according to a correspondent for the *Dallas Times Herald*.

The prosecutor was investigating whether EDS won its \$40 million contract illegally, whether the firm had bought influence with the Iranian government and whether it falsified vouchers worth millions of dollars. Iranian police have already arrested several high-ranking government officials in connection with the alleged misdeeds.

Drafted by EDS headquarters in Dallas to brief personnel subject to press interviews, the memo summarizes the suspicions of prosecutor Hossein Dadgar as well as the facilities management firm's point-by-point denials, according to Bob Dudney of the *Times Herald's* Washington bureau.

Although two EDS executives — Bill Gaylord and Paul Chiapparone — were imprisoned by Iranian authorities for nearly two months, EDS itself was never formally charged with wrongdoing.

EDS told Dadgar that it was willing to provide all documents and witnesses he cared to inspect outside of Iran and that it would pay the travel expenses for any Tehran authority sent to conduct the investigation, the memo reportedly asserted.

The firm's award of a \$40 million contract without competitive bidding especially interested Dadgar, the memo said. In November 1976, EDS signed the contract, scheduled for completion in three years, with the Social Security Organization (SSO).

After the signing, MHW and its chief, Shojaeeddin Sheikoleslamzadeh, "came under growing criticism in the media," the memo was quoted. "The campaign centered on charges of corruption and abuse of authority."

Sheikoleslamzadeh and other MHW officials resigned their posts last August and were arrested by Iranian police a few days later.

The next MHW chief approved the payment of two overdue monthly bills on the contract "after some deliberation," but only subject to clearance by Dadgar. The prosecutor's probe was under way months before the EDS men were arrested, the memo said.

Not long after EDS won its deal, the firm hired as a "well-paid consultant" one of the two officials who had represented Iran at the 18-month negotiations: Dr. H. Towliati of Iran's Plan and Budget Agency.

EDS had persuaded MHW to establish a centralized computing services unit, which Towliati reportedly ran for a few months until the firm hired him "to advise the ministry officials."

Dadgar considered Towliati's relationship with EDS to be illegal, Dudney said. But the memo claimed that Towliati answered only to the ministry, not EDS, and that the agency had cleared his transfer.

"Although the reasons were unclear, by the time [MHW] was coming under fire last summer, Chiapparone and one of the [ministry's] top deputies ...

were discussing termination of Towliati's contract," Dudney wrote in the *Times Herald*. A new contract was drafted to bring Towliati under service through April 1979.

By October, Towliati was uneasy about the appointment of a new SSO supervisor to whom he reported, the EDS document said. He formally resigned in November and was placed under arrest. No reasons for the arrest were given and Towliati is apparently still detained in Iran.

Dadgar also alleged that EDS had submitted several "false monthly reports" for payment under the contract, the memo continued. Each bill was for about \$1.4 million, according to the suit EDS has recently filed against MHW in a U.S. court (see story on

Page 4).

The firm maintained every voucher was legitimate and said EDS activities on the contract were closely reviewed by MHW and "external oversight committees, including royal commissions," Dudney reported.

On Jan. 5, about a week after Gaylord and Chiapparone were arrested, Dadgar told EDS the men would be freed if the firm deposited a \$12.75 million ransom in Iran's Bank of Melli, Dudney said. Dadgar told the executives they were "material witnesses" in the case against Sheikoleslamzadeh, apparently believing they could provide useful testimony.

Ten days later on Jan. 15, Dadgar's office told EDS it was investigating the

firm's destruction of \$3,260,000 worth of "sophisticated data tapes." Dadgar then asked EDS to give control of its DP systems to MHW.

EDS balked, claiming the ministry was, in effect, unqualified to administer such facilities, Dudney said. But on Jan. 22, EDS agreed to relinquish 10 to 12 tapes at a meeting a few days later — a meeting that was never held.

On Jan. 30, Dadgar reportedly offered Gaylord and Chiapparone immunity if they would disclose information that resulted in convictions.

Less than two weeks later Gaylord and Chiapparone were rescued. Perot later indicated he had paid some of the rebels to lead the prison assault [CW, Feb. 26].

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COMPUTER ASSOCIATES

Magnuson Adds Systems in Reaction to 4300

(Continued from Page 1)

system support.

The Magnuson introductions include the M80/32, with performance just under that of the 4341, and the M80/42 and M80/43, which top the 4341 in performance, according to the company.

Based on the firm's "strategic architecture," the units are essentially the same as the earlier M80 models, with increased functions and modules added to the system bus.

Using printed circuit boards containing systems logic and memory as essentially independent subsystems, Magnuson said it could "upgrade a single, compact computer throughout IBM's entire intermediate computer performance range."

Since the system is based on a bus architecture, additional modules can be plugged into the bus in the field to increase performance, Magnuson said. Users therefore will not have to replace entire systems when upgrading, just circuit boards within the systems.

For this reason, any of the Magnuson systems can be upgraded to any higher model within the "family" of systems, the firm added. Present M80/4s can be upgraded to M80/43s in one upgrade step, for example; the M80/3 is convertible to the M80/4, M80/32, M80/42 or M80/43, Magnuson said.

The M80/4 upgrade increases the processing power of that unit by 50% and the M80/3 options provide performance increases of up to 200%, the firm claimed.

Magnuson's system support representatives will be qualified to offer both hardware and systems software support and will be backed up by on-line remote diagnosis of both hardware and operating system problems, the company said.

Service offices are located in Atlanta, Boston, Chicago, Dallas, Detroit, Los Angeles, New York, San Francisco and Washington, D.C. Magnuson is hiring to augment its present staff of 70 support personnel.

The M80 systems console contains a microprocessor for diagnostics and a remote data link facility to provide on-line communications with any distant console, including the one at the Magnuson Technical Support Center here.

This permits personnel at the support center to operate the system remotely in order to diagnose problems, the firm said.

The Systems

Since all of the units feature basically the same processor, machine cycle time on each is 100 nsec and memory cycle time is 600 nsec, the firm said. The IBM 4341 has a machine cycle time of 150 nsec to 300 nsec and a memory cycle time of 900 nsec.

The upgraded M80/3 offers performance which is 50% greater than the IBM 370/138 and 50% higher than the 4331, Magnuson said. At the same time, the price on the unit has been cut from \$205,000 to \$180,000 for a unit with 1M byte of memory and three

channels.

The maximum memory is 8M bytes and upgrades cost \$30,000 per 1M byte, the firm said. Up to six channels can be handled by the system, and each costs \$5,300.

The upgraded M80/4 — whose price has been cut from \$395,000 to \$295,000 with 2M bytes and five channels — offers performance that is greater than 30% more than the IBM 370/148, Magnuson said. Memory and channel upgrades have the same maximums as the M80/3 and the same prices.

The new M80/32 has three times the performance of the 4331, Magnuson said, which makes it equal to the M80/4 and just under the 4341 in performance.

Selling for \$185,000 with 1M byte of memory and three channels, the unit can handle up to 8M bytes of memory and six channels. Memory upgrades for these systems cost \$15,000 per 1M byte.

The M80/42 offers 10% better performance than the 4341, Magnuson said, and is priced at \$275,000, compared with the 4341 at \$265,000. The system can handle up to 16M bytes and up to 16 channels. Additional memory is priced at \$15,000 per 1M byte; channels cost \$5,300 each.

The highest performer is the

M80/43, which Magnuson said offers 30% better performance than the 4341, putting it about on a par with the IBM 370/158 in performance. Carrying a price tag of \$315,000, the unit can handle up to 16M bytes of main memory and up to 16 channels, although the basic configuration features 2M bytes of memory and six channels.

Magnuson is presently using 16K chips for a total of 512K bytes on a circuit board module. When 64K chips are available, however, it will upgrade to them for 2M bytes per printed circuit board, the firm said.

One- to seven-year lease plans are available for the systems, mainly arranged through third-party financing, but Magnuson declined to give examples of specific plans.

The M80/3 and M80/4 are available immediately with 60- to 90-day delivery, the firm said. The M80/32, 42 and 43 will be available in the second quarter of 1980, approximately three months after IBM begins delivery of the 4341 with 4M bytes of memory. The delay is necessary, Magnuson said, to ensure that the units are compatible with the larger 4341s.

The upgrade of the M80/3 to M80/4 is available immediately, and the other upgrade options will be available in the third quarter of 1980.

Airlines Dig Up DP Models

(Continued from Page 1)

solely against cost of fuel to determine where to buy it, and it falls apart when fuel is not available," Darnell said.

When Texaco, Inc. asked National and other airlines to reduce consumption at New York's John F. Kennedy Airport by 50% in February, National was forced to cancel a number of flights to meet the cutback. However, it kept cancellations to a minimum by using the scarcity formula, run on the company's three IBM 370/158s.

This allowed National to carry extra fuel from locations such as Tampa and Miami, where there is no shortage, so its planes did not have to buy as much fuel at Kennedy.

Although other airlines, such as American Airlines, ferry fuel so they don't have to buy as much at airports with shortages, the National fuel allocation system was designed to map out a complex system. It can balance the costs of ferrying fuel over the entire route and achieve the lowest possible overall purchase price for the fuel, Darnell said.

Program Under Development

United enters the current shortage as the only major carrier without a large linear fuel ferry and allocation program of its own, although it is working more, according to Gordon McKinzie, manager of fuel and performance control for the company's flight operation.

The company is building and testing a system developed by McDonnell Douglas Corp., including a fuel shortage factor similar to National's. It is "kind of holding off, trying to get the best program from all the ones at which we've looked," McKinzie remarked. Until its own flight planning system is in place, the airline is working with a series of flight plans that use the cost of fuel as a factor.

To take advantage of existing fuel

supplies, it reactivated an on-line system last week based on an up-to-date fuel inventory. The system was last used during 1974, he said.

When a plane is fueled, the second officer on-board the plane radios vital information to flight operations through a radio network called Aeronautical Radio, Inc. (Arinc). That information includes the amount of fuel loaded on the plane.

"Our Univac Unimatic on-line system has a running inventory of the fuel at each station, so when the fuel is loaded on a plane, we have an up-to-the-minute picture of what each station looks like," McKinzie said.

Based on the station's fuel supply, United can project when the station will run low. "It's kind of crude. It's a beads-sorting type of thing, but it works," he noted.

Elaborate Planning System

Flight patterns at Pan American Airways are determined by the price differentials between airports, according to James Harding, vice-president of data systems management.

Pan Am, which had not announced any flight cancellations last week, uses an elaborate international flight planning system. Although the model was originally set up to minimize both fuel and time costs, Pan Am is "pretty much running our model on the basis that only fuel counts," Harding said.

Similar to other flight planning systems, Pan Am's can make refined calculations on how much fuel should be carried for any particular flight. If a flight is destined for an airport that charges significantly higher fuel prices, the model can determine how much fuel the plane can take on — considering factors such as weather and passenger load — before it becomes too expensive to carry extra fuel, he explained.

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World Cup Competitors Ski Against Scoring System And Improve Their Speeds

By Tim Scannell

CW Staff

LAKE PLACID, N.Y. — Spring-like temperatures and periods of light rain at the recent World Cup skiing competitions here failed to dampen the efforts of top-ranked skiers who pitted themselves against a computerized scoring system for faster times and speeds.

Although the warm weather created gaping bare spots on many of the downhill and slalom courses on Whiteface Mountain — making it necessary to add both man-made and carted-in snow — a number of favorites managed to capture the Lake Placid World Cup titles.

Austrian Annemarie Moser-Proell, considered a powerful and determined racer, won the women's downhill event with a time of 1:43.07, while Peter Wirnsberger, also from Austria, snatched the men's downhill prize by covering the 3,028-meter men's course in 1:42.88.

Sweden's Ingemar Stenmark won the giant slalom event by descending the 1,301-meter course in 1 minute, 19.51 seconds — the fastest time of the turn. This was the eighth straight giant slalom victory for the Alpine racer since the 1979 World Cup contest began in Europe last December.

'Score' Keeps Track

Texas Instruments, Inc. sponsored the Lake Placid races and also used its distributed data processing (DDP) system for Computerized Olympics Results and Events (Score) to keep track of schedules, register athletes and officials, publish starting lists, print biographical profiles and issue results of each event as it happened.

The sports monitoring system is composed of dual DS990 host processors, 29 Model 771 intelligent terminals, eight Model 820 keyboard send/receive (KSR) terminals and 10 Model 745 portable terminals. The KSR and portable terminals are used by more than 1,000 media representatives, including ABC television's sports department, to provide background and results of the World Cup events and transmit stories around the world, a TI spokesman noted.

Developed for Olympics

Score was developed for the upcoming 1980 Winter Olympics at Lake Placid and has been in operation since last October. Not only do the computers coordinate the activities of 18 individual sites within Lake Placid's Olympic Village, but they will also handle all the security functions.

Athletes, trainers, members of the press, spectators and sponsoring companies will all have to be cleared by the TI computer and recognized "as part of the Olympic family," before they will be admitted, the spokesman explained.

The Lake Placid races in the World Cup competitions are only three of 55 events that take place over more than a three-month period in Western and Eastern Europe, Scandinavia, North America and Japan.

Participants are awarded points according to how they place in each competition, and the three best scores are used to compute the skiers' overall point accumulation. The man and woman skiers with the highest overall point collections at the end of the total competition are designated as World Cup champions and presented with the Trophie Avions, or World Cup.

The competitions continue this week in Heavenly Valley, Calif., and wrap up next week in Furano, Japan, where the slalom and giant slalom finals will be held.



Wide World Photos

Ingemar Stenmark flies down slalom course to win World Cup.

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He Profits from Keypunch Error After All

By Tim Scannell
CW Staff

JERSEY CITY, N.J. — More than a year after a keypunching error put \$100,000 into his account at the Commercial Trust Co. here, coin dealer Charlie Walsh is in a court-sponsored work program and believes his temporary brush with wealth helped to bring him out of his shell.

"I never stole anything in my life," the 55-year-old Walsh said, looking back on the January day when he withdrew \$101,000 from an account that previously held only \$85. "I knew it was the bank's money, but you can't help but start to daydream... so I figured, 'What the hell. I'll take a chance.'"

Walsh was arrested last June. He is currently a member of a pretrial intervention program that allows him to work and make restitution for the crime of which he is accused, according to public defender Judith Rosenstein. Although only \$88,000 of the bank's money was recovered and Walsh still faces grand larceny charges and a possible jail sentence, all charges will be dropped if he doesn't get into any trouble for a year, Rosenstein said.

Last year, Walsh's Commercial Trust account was substantially bolstered when two \$50,000 deposits slated for a business account were diverted to his savings account [CW, March 13]. Although the bank refused to release any details on the mistake, it was learned that Walsh's account number differed from the commercial account by a single digit and that a keypunching error was the cause of the accident.

Police arrested Walsh in Portland, Ore., when they ran a routine spot check of his license plate number through the National Crime Information Center's computer and discovered that he was wanted in New Jersey for the Commercial Trust theft. Even though he was driving a new car allegedly purchased with the stolen funds, Walsh was using the same New Jersey license plates issued to him before the money disappeared from the bank, a police spokesman stated.

"I didn't know how to get phony

plates," Walsh remarked after his arrest. "I didn't know whom to ask."

Walsh's arrest ended a six-month holiday during which he traveled more than 17,000 miles in his new car and

visited such places as Las Vegas, Nev., where he was surprisingly frugal. "I'm no fool," Walsh said. "I didn't want to risk going to jail for one wild weekend."

According to reports, Walsh planned to use the bulk of the money to open a small hobby shop in the Pacific Northwest and live in security for the rest of his life — until he was apprehended.

NCR Haggling Over 'Fixed Price' Gear

(Continued from Page 1)

if, indicated it had run into NCR counteroffers on many of its recent bids. It claimed NCR offered discounts up to 70% off the stated price.

Many Users Unaware

However, while NCR has apparently been counterquoting in competitive situations, many NCR users seem to be unaware of the savings they can get just by looking at the competition.

A recent survey of 20 random users around the country by *Site Scenes*, a publication directed just to NCR users, found that 40% of those users believed the firm has a "fixed price, or one price for all." Forty-five percent said they believe NCR engages in "competitive or flexible pricing," and 15% were in the "don't know" category.

When the users who said the price is fixed were asked, "If you knew that NCR's pricing was flexible, would your opinion be: positive, negative or neutral?" half indicated a negative reaction with remarks like, "I paid full price and I feel cheated" and "It will lead to an unstable market," the publication's December issue said.

Of the 45% who believe NCR practices flexible pricing, 67% said they had been quoted prices at other than list price, according to the publication. In all of those cases, the users said competition had been involved.

These users liked the flexible pricing, with the typical reaction being something like, "As a professional manager, I owe it to my company to negotiate the best possible deal."

Users contacted by CW shared those reactions, but felt that the cross fire between the competing vendors often put them in the middle.

While it was "pleasant to see the price drop," it was "unpleasant" to be in the

middle of the price war, since either NCR or the competitor would be offended by whatever decision was made, one user said.

This user, who stuck with NCR after the price came down, cautioned, however, that NCR price lists were flexible and so he could not really say for how much "off list" he had gotten the system.

The whole configuration was juggled around, he said, but added that the final price was certainly lower than the original price quoted by his NCR sales representative.

Another user, who chose to go to a competitor, said NCR had been cutting prices right up until the day before he made his decision. But "they didn't cut them enough to get the order."

This user indicated that when he asked NCR to sit down with the third-party supplier to discuss potential maintenance problems and responsibilities with third-party equipment, NCR said it would not.

The situation had been "unpleasant, to say the least," the user recalled.

In another case, both NCR and Computer Enhancement offered upgrades to the NCR 658 disk drive to boost it from 100M to 200M bytes.

The increase, one user said, essentially involves changing one wire within the system. Computer Enhancement replaces a whole circuit board in its upgrade so the board can be taken out and replaced by the original NCR board if NCR has problems maintaining the system.

Originally, the user said, NCR of-

fered the upgrade for a purchase price of \$14,200. When Computer Enhancement offered it at \$7,500, however, NCR cut its price to \$5,000, leading Computer Enhancement to cut its price to \$2,500, which the user accepted.

However, while the purchase price was coming down, the rental price remained the same, the user said, since Computer Enhancement did not offer lease schemes. The price now stands at \$300/mo on the rental plan.

Another user reported that as a result of the bidding war in his installation, he was able to get 256K bytes of main memory for the amount he had budgeted for 64K bytes.

George Cimo, president of Computer Enhancement, which is one of the independents in the market, charged that the moves by NCR are an attempt to shut off its base from any outside competition at all.

Even users who try to sell NCR equipment to other users run into this competition from NCR, Cimo said. NCR treats these users exactly the same way it treats an outside firm trying to sell to the NCR base, countering their prices with new NCR prices.

In addition, Cimo charged that NCR "offers package deals which include discounts on noncompeting products, e.g., software services and processor and peripheral features."

"Of course," Cimo added, "only those NCR users who seriously consider another user's equipment from independent suppliers are offered such deals."

Freeze on IMS Predicted

(Continued from Page 1)

escape the resulting taint, the company might feel compelled to introduce an IMS alternative, he suggested.

Robinson views a relational data base as the most likely successor to IMS primarily because the other two possible alternatives seem to be even more improbable candidates.

One of these other two possibilities is a data base system conforming to Codasyl standards. Given IBM's long history of opposition to Codasyl's data base recommendations, that alternative stands little chance of prevailing, Robinson surmised.

IBM would probably relent in its opposition only if the federal government instituted a policy requiring all its data bases to conform to Codasyl standards, he added.

Another possible alternative might be a system incorporating new architectures. But IBM's traditional role as a self-appointed industry pacesetter would probably preclude that option, which would force the company into the unpleasant position of playing technological "catch up."

Turning his attention to the future of data base management in general, Robinson predicted the eventual emergence of dedicated and distributed data

base systems.

In a typical dedicated system, a user would offload its data base management jobs to a minicomputer or microcomputer specializing in just those applications. In this way, the dedicated processor could relieve the DP burden on its host and at the same time cut the mainframe's channel and memory loads, he reasoned.

A typical distributed data base system, meanwhile, would allow users to access data anywhere in a network without first ascertaining the data's location. During program development, a user at any remote node would request a necessary piece of data from the network's central node, which would incorporate a data dictionary.

By consulting its dictionary, the central site would locate the needed data and send it from its current address to the requesting node.

In this way, a distributed data base system would give users the valuable ability to write programs, even though they might not know where all the necessary data is filed. Unfortunately for users, distributed data base systems are still only a DP theory and probably won't gain widespread acceptance for another five to eight years, Robinson predicted.

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Loss of Control Cited as Consumer Fear of EFT

By Brad Schultz
CW Staff

OMAHA, Neb. — The greatest obstacle to widespread acceptance of electronic funds transfer (EFT) systems may be consumer fears about loss of control over personal transactions, according to surveys of state-level consumer protection agencies and regulators of financial institutions.

The surveys' results were reported to the American Banking Association's (ABA) Subcommittee on EFT of the Committee on Law Relating to Computers by Fred M. Greguras, the subcommittee's chairman, and Ann L. Wright, a Creighton University law student.

The surveys indicated that legal protection from EFT abuse is not a key factor in whether consumers accept EFT systems, Greguras and Wright said.

The poll of agencies that regulate financial institutions was taken before passage of the EFT Act last fall. Seventeen state regulators said that such statutory safeguards are not needed to "generate sufficient volumes of EFT use to justify systems cost," while 12 states replied that safeguards are required. The rest of the nation (including Puerto Rico) declined to comment.

Most consumer protection agencies offered no opinion when asked the same question. The agencies for nine states said safeguards are necessary for cost-justified EFT, while five said protection is not necessary.

Consumer Protection Provisions

Greguras and Wright compiled a priority ranking of 12 specific consumer protection provisions based on the responses of regulators that said some provisions must exist for financial institutions to profit from EFT networks.

Each of these agencies named, in order, the four types of legal protection it considered most important to satisfy consumer demands. Greguras and Wright applied a four-point rating scheme to each response (where 4 = most important and 1 = fourth in importance) and then added up the points for each protection type.

They determined that the most important type of provision from the consumer's standpoint is "a loss limitation for unauthorized [EFT] use," which tallied 46 points.

Tied at 22 points for the distinction of second most important consumer protection provision were security of the personal identification number (PIN), including the issuance and transmission of PINs, and consumer privacy.

At 18 points, the third most important type of legal protection from EFT abuse was that which would ensure "security of transmission lines against unauthorized access," the report continued.

The fourth most important type concerned "full disclosure of the terms and conditions of the EFT agreement, including the consumer's rights and liabilities" (14 points). The fifth most important type: "a mandatory and speedy error resolution procedure" (13 points).

The priority list suggested that, according to state governments, consumers are more concerned about security than any other subject of actual

or possible EFT legislation, the report observed.

Shortly after the survey was taken, President Carter signed into law an amendment to the Consumer Credit Protection Act that provides many of the protection types regulators considered most important to consumers [CW, Oct. 23].

Will EFT Act Affect Use?

To learn what regulators thought of the EFT Act, Greguras and Wright distributed a second round of questionnaires. This time, they asked the state agencies to indicate whether the EFT Act would have no impact on consumer EFT usage; whether the law would increase usage slightly, moderately or greatly; or whether the law

would have no present impact "but should at a later time."

More than half the 41 financial institution regulators that responded said they thought the EFT Act would have no immediate impact on consumer usage, but that it would have an eventual impact. One of these regulators "qualified his response by stating that the later impact depends on financial institutions' promotional follow-up," Greguras and Wright reported.

The second survey also polled the regulators on deterrents to EFT usage. The questionnaire included a list of eight deterrents to usage.

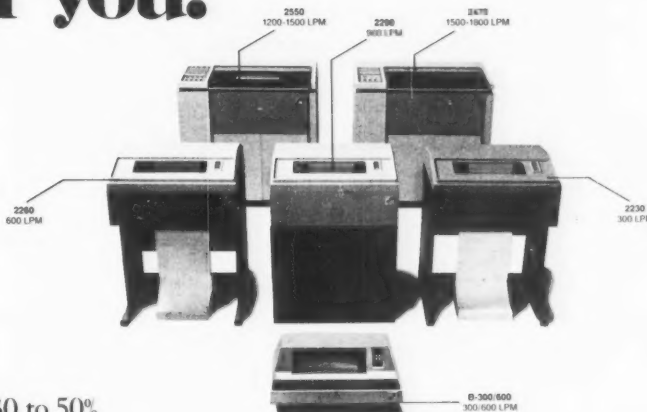
Each financial institution regulator or consumer protector was asked to order the list subjectively according to degree of deterrence. Greguras and

Wright then applied an 8-point rating scheme (8 = greatest deterrent, 1 = eighth place) and summed points for each deterrent category.

According to financial regulators, the major deterrents to EFT usage are fear of losing control over transactions (249 points); complexity (208 points); simple, unqualified fear (197 points); safety fears (186 points); and fear of privacy loss (176 points). Consumer protection agencies said the major deterrents are control (105 points), safety (84 points), simple fear (83 points), changes in recordkeeping (81 points) and complexity (70 points).

Both respondent groups thus considered fear about losing control of transactions the greatest deterrent to consumer acceptance of EFT services.

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Over Objections of Test Group IBMer Defends '64 Release of Bug-Ridden 360s

By Connie Winkler
CW Staff

NEW YORK — IBM's Product Test Group did not support the announcement of most IBM 360 hardware and software products, but G. Berry McCarter, testifying in the U.S. vs. IBM antitrust case, managed to explain away those Product Test objections. McCarter, who between 1960 and 1972 was either manager or group director of Product Test, is currently on the staff of the group director of systems development for IBM's Data Processing Product Group.

Product Test, part of the Data Processing Product Group, is IBM's internal independent testing group. The fact that it did not support the announcement of 360 products has been a key card in the government's case. The Justice Department charged that the 360 was announced prematurely for the purpose of fending off competition.

Last month the government introduced IBM memos written in the mid-1960s in which McCarter was critical of management's handling of the 360 announcements. Management chose to behave as if the company could release perfect products without first modeling and testing them, McCarter indicated. Engineering and manufacturing personnel were forced into unreasonable commitments with inadequate resources," he said in a 1965 letter to management commenting on delays in delivery and manufacturing schedules.

Big Headache

One of IBM's biggest headaches at the time was the 360 operating system (OS/360), which McCarter said went through 21 or 22 releases and was not supported by Product Test until the last release. The first half of those OS/360 releases were riddled with programming bugs, and McCarter testified that one release was known to have bugs.

Customers were informed of all those bugs, however, McCarter said on questioning by IBM counsel Robert Mullen. Government counsel Richard Boote suggested in his cross-examination that customers found

more bugs than IBM did, and McCarter agreed this was so.

Because the 360 products lacked Product Test support, they were announced as exceptions, and the government tried to show that this was an unusual course of action. In a memo dated May 13, 1964 — the 360 was announced on April 7, 1964 — McCarter wrote that 67 major standard products and 121 major programming systems were announced between March 21, 1961 and April 1, 1964. Of those, all but two hardware and two software products were supported by Product Test.

In his direct testimony, consisting of a 61-page statement, McCarter explained why these products were announced despite lack of support from the Product Test unit. Basically, if Product Test does not support an announcement, that is, gives its "non-support" in IBM jargon, the objection goes directly to top IBM management — the Corporate Management Committee (CMC).

McCarter said that on March 16, 1964 he told the CMC of Product Test's nonsupport of the 360. Problems were found with the aluminum coating of component modules and these would affect at least the first 29 machines, McCarter told the CMC.

IBM chairman Thomas J. Watson Jr. was distressed with the module problems, and a concentrated effort was made to rectify them at that time. However, McCarter pointed out on the stand, IBM's internal standards for reliability and serviceability were higher

than those of its customers, who were thus satisfied with a lower level of performance than was IBM.

"When the [360/40] was shipped, it performed to the customer's satisfaction. It did not follow from Product Test's nonsupport of March 16, 1964 that IBM could not or would not deliver what it had committed to customers in the April 7, 1964 announcement of the 360 Model 40," McCarter said in his direct testimony. "On the contrary, Product Test's input was one of the mechanisms, like internal targets, designed to assure that it would."

McCarter gave the following additional explanations for the announcement of certain key products despite Product Test nonsupport:

- No one had anticipated how enormous and complex the programming for OS/360 would be, nor how great would be the customer demands on it later.
- The 360/90 program was to advance the state of the art in computer technology, and testing procedures had not even been developed for it. Because it was requested by customers, the customer negotiation and public disclosure had to precede the development of the product.
- The 360/67 with the time-sharing operating system was also developed at customer request, and because of scheduling conflicts there wasn't time to run Product Test tests.

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Technology of Future Seen Helping Managers Manage

TORONTO — The technology of the future will not only help companies reduce office and clerical expenses, but will "help managers manage," according to John J. Connell, executive director of the Office Technology Research Group.

Speaking recently at the first annual Office of Tomorrow Conference here, Connell said two developments have made new office systems and their inherent benefits possible: microprocessor-based technology and the growing trend toward the interconnection of office systems through telecommunications.

"While the benefits of microprocessor technology lie in improved office productivity, the interconnection of systems through telecommunications will dramatically increase the speed and efficiency with which a company conducts its business."

Faster communications and improved productivity will also affect the way organizations arrange their hierarchies, he said, allowing them to consider "restructuring the hierarchy to eliminate unnecessary layers."

A manager in charge of a number of subordinates will benefit from a slimmed-down office hierarchy, Connell stated. Increased speed of communication will allow him to manage more people without risking a communication breakdown.

The wider selection of organizational, managerial and operating alternatives offered by the new office technology can be "exceptionally attractive from an economic point of view and can upgrade the operating effectiveness of the entire enterprise to a level not possible before," Connell said.

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Diebold Withdraws from U.S. vs. IBM Trial

By Connie Winkler
CW Staff

NEW YORK — After months of preparation and negotiation with the Justice Department over what documents he would produce, IBM witness John Diebold has thrown up his hands in despair and pulled out of the U.S. vs. IBM antitrust trial.

By withdrawing from the trial before actually taking the stand, Diebold has protected information about his personal finances and information in which his clients' competitors would be interested. However, his withdrawal has done to the IBM trial what the recent record snowfall did to New York City.

Diebold, president and founder of The Diebold Group, which does consulting for DP vendors and users (including IBM), was expected to testify about the competitiveness of the computer business and IBM's role in the industry.

In a letter to IBM counsel, Diebold said he was withdrawing because he didn't want to disclose confidential information about his clients or "sweeping information" about his personal finances. Moreover, he did not want to spend a month on the stand under cross-examination.

"However the matter stands for IBM, the balance of cost and benefit in appearing as an expert witness has shifted beyond manageable limits," Diebold's letter said.

No Qualms

Justice Department lawyer Robert J. Staal voiced no qualms about Diebold's withdrawal at this advanced stage. "I feel we benefit anytime a witness is withdrawn," according to Staal, who heads the government team and was to have questioned Diebold. "This shortens the case."

In the short term, however, Diebold's removal from the witness list has left IBM's law firm, Cravath, Swaine & Moore, without a witness ready to testify. There have been no court sessions for the past two weeks.

Diebold's decision came after two months of haggling with the Justice Department over which papers he would have to make available to the Justice Department's Antitrust Division to enable it to prepare for cross-examination. During that time Diebold also prepared and reviewed his direct testimony, which would have been submitted in writing, and he spent eight days giving deposition testimony in anticipation of his court appearance.

Reached Impasse

The government's main hang-up with Diebold's testimony was how Diebold was to substantiate statements he might make on the stand. Although Diebold turned over 100,000 pages of documents to the government, he refused to show what he called "client studies."

As far back as December, the government was negotiating what documents would be submitted. Many meetings took place in Judge David N. Edelstein's chambers over the client studies question. Diebold was represented in these sessions by Marvin E. Frankel, who recently stepped down from the federal bench.

Finally, in a Jan. 19 memorandum, Diebold refused to hand over the client

studies, arguing that he had no role in their preparation, would not testify about them and would not break his confidential relationship with his clients. Diebold's lawyer argued that a government witness, Frederic G. Withington, a consultant with the firm of Arthur D. Little, Inc., did not have to turn over similar documents to IBM; therefore Diebold should not have to either. (Withington testified in July and August 1977.)

Edelstein, however, did not accept Diebold's arguments and on Feb. 5 ordered that the client studies be produced to the government. Edelstein agreed with the government's argument that the client studies were relevant to cross-examination.

The government, in its memorandum

to the court, claimed that Diebold relied heavily on his staff for the data underlying his expert opinions and even placed his name — in fact, the name of the company — on each study done by his staff.

It was the combination of Edelstein's motion, disclosures of personal finances and the time demands of the trial that caused Diebold to withdraw, according to Ronald S. Rolfe of Cravath, who would have questioned Diebold for IBM. The Justice Department forced Diebold off the stand, Rolfe charged.

Diebold started in the consulting business in 1954, initially specializing in the use of computers, but The Diebold Group has since grown to a general management consulting firm.



John Diebold

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But Not Any Services

GSA May Let Agencies Get Own DP Gear

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Federal agencies may soon be authorized by the General Services Administration (GSA) to carry out all their own procurements of data processing equipment, according to Frank J. Carr, commissioner of GSA's Automated Data and Telecommunications Services (ADTS).

Presently, agencies must receive GSA approval to acquire DP equipment costing more than \$300,000. The proposed increase in agency authority would not be extended to cover DP services and would apply only to

equipment procured "on a fully competitive basis," Carr said.

The agencies would be given the pro-

satisfy certain criteria that would, in essence, give them a blanket delegation to carry out all their own ADP pro-

'It shifts the burden from GSA reviewing procurements to having the procurement people in the agencies review procurements. Now it will be a test [of whether] they'll measure up to the added responsibilities.'

urement power through a "certification program" under development for the last two years and likely to be implemented by end of this year. "The idea behind it is to certify agencies that

urements," Carr explained.

GSA has been studying in particular the criteria with regard to the procurement function, he said — "Just exactly what qualifications would procurement people have to have, what kind of experience in ADP acquisitions." In addition, agencies would have to demonstrate competency in "the upfront part of acquisition planning."

"The procurements where we've run into trouble have less to do with the technical competence in the agencies but more with regard to their ability to manage the resources properly, manage the system acquisition process," Carr pointed out.

To receive procurement certification, agencies will have to develop a "process that matches the acquisition to the requirement" — a process, Carr said, that involves "identifying mission needs, examining the alternatives to satisfying the needs and carrying out the rest of the process to ensure that we have competitive procurements of whatever is needed to meet the agency's requirements."

Carr emphasized the program is "not at all in variance with the Brooks Act," the 1965 law that gave GSA the responsibility for managing all government DP procurements. While the act "gives the procurement authority to GSA," he said, "it is silent on whether we exercise the authority directly or we delegate the authority."

Ceiling of \$1 Million

The certification program is one of several moves contemplated by GSA to streamline the government procurement process. The agency recently increased to \$300,000 from \$50,000 the ceiling for procurements that can be made by agencies without GSA approval, and that ceiling will probably be raised to \$1 million by the end of the year.

Carr declined to estimate what savings in money or time might be realized by these GSA actions, but noted they are moves agencies have wanted for some time.

"But it also puts a burden on them because in effect the procurement officers in the agencies are the ones who have to satisfy themselves that proper feasibility studies have been made, that if communications is involved the communications systems study has been made, that the requirements of the Privacy Act have been satisfied, that the equipment to be procured is budgeted for."

"It shifts the burden from GSA reviewing procurements to having the procurement people in the agencies review procurements. Now it will be a test [of whether] they'll measure up to the added responsibilities they have. The accountability is on them now, and what we will end up doing as far

as the agency certification program is concerned is really going to depend in part on what we see come out of the earlier moves," Carr said.

If agencies are not carrying out their responsibilities for procurements less than \$300,000, the commissioner said, "we certainly aren't going to go to \$1 million [and] a complete blanket delegation on all procurements. So we in effect now have an ongoing test of the concept of earned autonomy and the wisdom of an agency certification program."

Although the \$1 million threshold, if approved, will be granted to all agencies, the certification program will be done "fairly slowly," on an agency-by-agency basis, he said. Some agencies might never qualify for certification, he predicted.

Those agencies GSA finds not properly exercising their authority under the \$300,000 ceiling will lose that authority.

The GSA might decide in the future to liberalize the restrictions on contracting for time-sharing services. "We did examine it at the time we modified the [Teleprocessing Services Program (TSP)] last year," Carr said. He noted that time-sharing vendors are pushing for changes in the TSP regulations [CW, Dec. 25-Jan. 1].

Some agencies are already preparing to take advantage of the certification program.

Course to Show How to Contract With Third-Party

WINTER PARK, Fla. — International Computer Negotiations, Inc. (ICN) will sponsor a three-day seminar on third-party lease negotiations May 7-9 here.

The course will cover potential problems that can arise in third-party contracting; ways of optimizing the financial aspects of a third-party leased equipment acquisition; the proper balance between price and protection; negotiation strategies and tactics; types of leases and sources of funding; guidelines for drafting and analyzing a lease document; investment tax credits and depreciation; and advantages and risks of leveraged leasing decisions.

The seminar, which costs \$595, will be held at the Langford Resort Hotel. More information is available from ICN at 1331 Palmetto Ave., Winter Park, Fla. 32789.

Walsh Reelected To Cause Office

NOTRE DAME, Ind. — R. Brian Walsh, director of the University of Notre Dame Computing Center, has been elected to his second consecutive term as secretary-treasurer of Cause.

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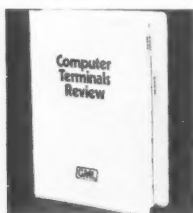
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Expo '79 Opening Tomorrow at N.Y. Coliseum

NEW YORK — The Mid-Atlantic Computer Expo '79, which opens for a three-day run at the New York Coliseum tomorrow, will present daily debates between representatives of leading vendors of DP equipment, software and services — a new feature this year.

Representatives from Cullinane Corp., Software AG, Cincom Systems, Inc., Infodata Systems, Inc., MRI Systems Corp. and ADR/Datacom will gather on stage to discuss "The Data Base Question," setting the pattern for panel discussions in other areas, according to a spokesman for the Caravan Group of Newton, Mass., sponsor of the show.

The show, which begins the series of Expos in nine major metropolitan cities in the U.S., will feature keynote speeches by U.S. Sen. Abraham Ribicoff (D-Conn.), Paul Strassman, vice-president of Serox Corp., and Robert Fertig, vice-president of Advanced Computer Techniques Corp.

The more than 60 companies displaying computer equipment and related products at the Coliseum exhibit hall include Eastman Kodak Corp., Hewlett Packard Co., General Electric Co. and Applied Data Research, Inc. (ADR).

Eleven panel discussions will be conducted during the New York conference, after which the sessions will be opened to the audience for questions, suggestions or vendor exchanges with users.

At the end of each session, users will have an opportunity to speak to vendors at the exhibits to gain hands-on experience with the equipment or services discussed during the briefing sessions.

Three Sessions Tomorrow

Three sessions are scheduled for tomorrow. In the morning, representatives from Mohawk Data Sciences Corp., HP, Honeywell, Inc., Data General Corp., Four-Phase Systems, Inc., Cummins-Allison Corp. and Pertec Computer Corp. will discuss "Distributed Data Processing."

In the afternoon, representatives of Racial Milgo Information Systems, Inc., Penril Corp., General Datacomm Industries, Inc. and Dynatech Corp. will hold a session on "Data Communications Control Methods."

"Small Business Systems" will be debated by speakers from National Cash Register Corp., Burroughs Corp., HP, DG, Coventry Business Systems Corp. and Wang Laboratories, Inc.

On Wednesday morning, representatives of Courier Terminals Systems, HP, Cummins Allison and Pertec will discuss "Intelligent Terminal/Data Entry." Speakers from

Shugart Associates and Electronic Memories and Magnetics Corp. will talk about "Semiconductor Memory Alternatives."

In the afternoon, delegations from Kodak, Datagraphix, Inc., Computer Micrographics Corp. and U.S. Data Corp. will discuss "Computer Micrographics," while representatives of Cambridge Memories, Inc., National CSS, Inc. and American Terminal Leasing

Co. consider "Plug-Compatible Processors."

"The Data Base Question" showdown between vendors will take place Thursday morning.

"DP Trend Briefing Sessions" at the Computer Expos cost \$75 each or \$195 for a complete three-day conference. The Computer Expo exhibits are open without charge to business and industry people.

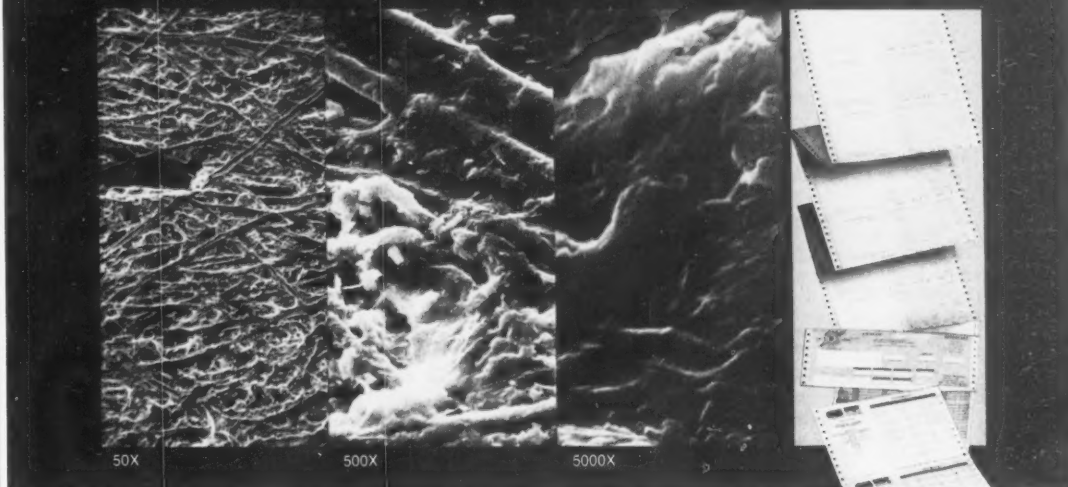
Bonus at Show

NEW YORK — As a bonus to those attending the Mid-Atlantic Computer Expo '79 here this week, Resource Software International, Inc. (RSI) of Englewood Cliffs, N.J., will give away New Jersey State Lottery tickets.

The tickets will be offered to the first 500 attendees who complete the company's minicomputer software questionnaire at its booth, an RSI official said.

More than 60 companies are expected to display \$10 million worth of computer equipment and related products at the Coliseum exhibit hall.

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California DP Crime Bill Delayed for Redraft

By Jeffrey Beeler

CW West Coast Bureau
SACRAMENTO, Calif. — California's version of the proposed federal computer crime bill hit a snag last week when the state Senate's Judiciary Committee temporarily declined to rule on whether the proposed law should go to the state legislature for possible enactment.

Committee Chairman Sen. Jerry Smith (D-San Jose) told the bill's sponsor, Sen. Lou Cusanovich (R-Woodland Hills), and his staff to redraft parts of State Bill 66 after committee members and wit-

nesses alike warned that dire consequences could result if the proposed legislation's phrasing weren't clarified.

Smith's order means the bill will be reworked by the California DP Management Office before returning to the Judiciary Committee in an estimated two to four weeks for reconsideration. At that time, the Judiciary Committee is expected to reexamine the revised bill's merits and decide whether to kill the proposed legislation in committee or forward it to the California Senate Finance Committee for fiscal analysis.

Introduced early last December by Cusanovich and amended in mid-February, S.B. 66 amounts to a California equivalent of S. 1766, the federal computer crime bill sponsored by Sen. Abraham Ribicoff (D-Conn.) and currently undergoing debate in the U.S. Senate.

If enacted, S.B. 66 would empower the state of California to prosecute individuals who "knowingly and willfully" access computer equipment for attempted theft or fraud. The bill would also outlaw malicious destruction of any computer property and forbid "unauthorized" users from accessing, disclosing or altering computer programs and data "with the intent to cause harm."

Individuals convicted under the law would face a fine of up to \$50,000, a two- to four-year prison sentence or both.

Varying Opinions

In a brief presentation last week before the Judiciary Committee, Cusanovich characterized S.B. 66 as necessary to curb the rapid growth of computer crime in both the public and private sectors. With state DP officer and S.B. 66 defender Don Metzker at his side, the senator argued that the tremendous financial harm caused by computer misuse and the difficulty of prosecuting that misuse makes adoption of a computer crime bill imperative.

Committee Chairman Smith, however, seemed less swayed by Cusanovich than by the bill's critics, who complained that S.B. 66's imprecise language could leave the computer industry wide open to dangerous overregulation by state government and law enforcement agencies. The dissenters included committee member Bob Wilson (D-San Diego) and two programmers — John James of the Berkeley, Calif.-based Cetus Corp. and John Taber of IBM's Santa Teresa, Calif., laboratory.

Much of the opposition to the bill stemmed from its use of the controversial phrases "without authorization," "access" and "with intent to cause harm." In formal presentations before the committee, both James and Taber warned that unless phrases like "unauthorized access" are defined more specifically in the bill, individuals could someday face criminal prosecution for "offenses" as piddling as using their firms' computers to play ticktacktoe.

A law that would "make new crimes out of common practices, which have not been regarded as crimes before" could seriously impede technological innovation in the computer field, according to James, who, like Taber, stressed he was

speaking strictly as a private citizen and not as his firm's official representative.

Many industry breakthroughs, such as IBM's development of magnetic disk technology, started with a few maverick innovators working in secret, without authorization, James explained. Only later, when the significance of their work was fully appreciated, did the innovators' clandestine projects gain the official stamp of approval.

"If [S.B. 66] were in effect, [the originators of magnetic disk technology] might well have thought twice about their project," and they might also "have been convicted of a felony," he speculated.

Ominous Specter

James and Taber also criticized the proposed legislation as unnecessary. Almost all crimes involving computers are already covered under existing statutes for theft, fraud and vandalism, they said.

Why then, they asked, does the government insist on put-

ting "computer crime" in a special legal category? Indeed, Taber added, why use the term "computer crime" at all since the phenomenon is basically no different from any other kind of crime?

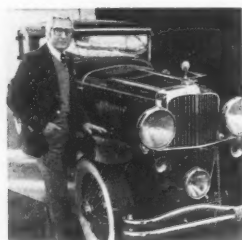
For James and Taber, these questions evoke the ominous specter of growing government regulation in computer industry affairs.

If S.B. 66 passes in its current form, they claimed, California law enforcement authorities could arbitrarily seize a company's data files under the pretext of a criminal investigation.

To forestall such an unpleasant prospect, Taber urged rejection of the bill and any other legislation threatening to increase government's control over the activities of computer users and vendors.

At the very least, the California legislature should seek the computer industry's advice before enacting any laws that affect its future, James recommended.

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CW3129

In Support for Sharansky, Orlov

No More Help for Soviets, 2400 Scientists Say

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — In response to the jailing in the Soviet Union of dissident computer scientist Anatole Sharansky and physicist Yuri Orlov, more than 2,400 U.S. scientists have pledged to end or restrict their participation in U.S.-USSR scientific exchange programs.

Representatives of the ad hoc Scientists for Orlov and Sharansky (SOS) told a press conference here March 1 that the actions of the 2,400 SOS participants is an unprecedented attempt "to deprive the Soviet Union of some of the benefits of U.S. science and technology" because of alleged Soviet repression.

Dr. Kurt Gottfried, a physicist from Cornell University, said no action of this magnitude has ever been taken before by scientists on behalf of their colleagues. Neither the Nazi rule in Germany nor the mass jailings during Stalin's day provoked this kind of reaction from the U.S. scientific community, according to SOS.

Two Petitions

An SOS "Statement of Conscience" pledging to "withhold all personal cooperation with the Soviet Union until Yuri Orlov and Anatole Sharansky are released" was signed by 1,750 scientists.

Another 660 promised to stop attending international conferences in the Soviet Union, to oppose increased technical exchange programs and to fight "most favored nation" status for USSR "until the Soviet government provides tangible proof that it has curtailed its persecution and harassment of our Soviet colleagues."

Sharansky lost his job after applying for permission to emigrate to Israel in 1973. Two years ago, he was charged with spying for the Central Intelligence Agency, a charge on which he was convicted last July and sentenced to 13 years in prison at hard labor.

Orlov, a high energy physicist, was arrested two years ago after becoming chairman of the Moscow Helsinki Watch Group, which monitors Soviet compliance with the Helsinki human rights accords. He was convicted last May of anti-Soviet activity and sentenced to seven years at hard labor and five years of enforced internal exile.

Although SOS was formed six months ago in response to the jailing of Sharansky and Orlov, the group has also expressed concern for eight other Russian scientists said to be victims of Soviet repression. Included are Doctors Viktor and Irina Brailovsky. The two computer scientists, husband and wife, have lost their jobs and been threatened with arrest since applying for permission to emigrate to Israel.

'Humane Reasons'

At the SOS press conference, Dr. Joseph Weizenbaum, professor of computing science at MIT, said "we computer people are particularly interested in this for fundamental humane reasons and because computer scientists play a large role in U.S.-Soviet scientific exchanges."

Because the U.S. is significantly ahead of the Soviet Union in computer technology, "we are called on very of-

ten by our colleagues in the Soviet Union" for assistance.

Weizenbaum also noted that the Association for Computing Machinery (ACM), through its officers and members, has supported Sharansky by "refusing to cooperate with the Russians in staging conferences" and other technical exchanges. Daniel McCracken, ACM president, is one of the sponsors of the SOS effort to gather signatures on the two petitions.

'No Intention to Punish'

"It is not my intention to punish the Soviets," Weizenbaum said, but "it is crucially important for scientists as well as other people to open their eyes,

confront reality and take account of what is going on in the world."

He said he does not know what effect the SOS petitions will have on the Soviets or on American companies that are trying to sell computer equipment to the Soviet Union. However, equipment sold to the USSR is useless without U.S. scientists and technicians to train the Russians and help with such things as software development, he pointed out.

The MIT professor indicated SOS is relying on peer pressure to make its efforts successful. From now on, he said, any scientists who participate in technical exchanges with the Soviets might feel uncomfortable when meeting their

colleagues who refuse to participate in such exchanges.

Support From Others

In addition, he said, the present signers of the SOS statements "represent only a small fraction" of those who support the group's goals.

Cornell's Gottfried said he believes SOS can be effective because the Soviet Union cares very much about its scientific reputation and about the level of its scientific programs. He conceded, however, that as a nonpolitical group, SOS will probably have little impact on efforts by the Carter Administration to have the Soviet Union granted "most favored nation" status.

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Jaycees Name Felon Man of Year for DP Work

By Jay Woodruff
CW Staff

SEATTLE — Tim Scully, an inmate at the McNeil Island Federal Penitentiary here, has been named Outstanding Man of the Year by the Washington State Jaycees.

The 34-year old felon, convicted of conspiring to possess, manufacture, sell and distribute LSD in California in the mid-1960s, is believed by Jaycees here to be the first prison inmate ever to receive the award.

Scully was honored for his work on a computer system designed to help severely disabled persons to communicate. His work has received considerable notice, and it may ultimately be used to help disabled veterans.

Indicted in 1973, Scully has served

five years of his 10-year sentence and may be paroled as early as this summer, sources indicated.

Friend Sparks Interest

Scully became interested in the award-winning project while he awaited sentencing in 1973. Through a friend of his parole officer, he was introduced to a woman who taught handicapped students.

Through her he met Robin, a 23-year-old woman who was crippled by cerebral palsy. The only movement she can control is the movement of one knee to the side.

Because he had owned a company that manufactured biofeedback equipment, Scully was asked to help her. He gave her biofeedback training for improved muscle control.

That was the beginning. When he entered prison, Scully "negotiated a peaceful coexistence with the staff psychologist" and worked as his assistant. He won approval to begin working on a communications device for Robin to replace one created by her family.

That device consisted of a clock motor attached to a bicycle spoke which she could stop at any letter on a circle by activating a switch next to her knee.

This device was very time-consuming to use because it took a minute for the spoke to travel full circle. Assembling a single sentence could be a 15-minute operation.

Building from Kit

Scully built a computer from a commercially available kit from Polymorphic Systems, Inc., of Santa Barbara, Calif. and wrote a program adapted for Robin's use. To operate the switch, he made a one-bit input port.

The CPU is an S-100-based microcomputer with 8K of random-access memory (RAM) and a CRT capable of displaying 16 lines of 64 characters. The program has three main modes — spelling, punctuation and words — and 27 alphabets arranged so Robin can assemble words with great efficiency, given that whole sentences must be put together with the movement of a single switch.

The first alphabet is arranged so that the most frequently used letters appear on the screen first, scrolling from right to left. Once the first letter — 'a,' for example — is selected, the system immediately displays all the letter combinations likely to follow.

Spaces between words automatically appear when one word is finished and the first letter beginning the next word is selected.

Complete words can also be called up in a 1,000-word directory of alphabetically ordered groups, similar to the word headings on each page of a dictionary. After picking the word group,

a subgroup of 10 words is displayed, and the appropriate word can be chosen.

The punctuation mode is operated in the same way as the spelling and word modes, Scully said. Under punctuation is a control function, including commands for backspacing and erasing words or entire blocks of text.

After delivering the microcomputer and the program to Robin 13 months ago, Scully became involved in Federal Prison Industries (FPI), a government-supported corporation set up to give inmates the opportunity to develop good work habits and learn job skills.

Since some of the industries manufactured electrical components, Scully persuaded FPI to begin developing communications equipment for disabled veterans. "I got the green light to work with an FPI design engineer, and we had an agreement that FPI would get the rights to use programs for devices to be sold to the federal government and I'd get rights to programs for the private sector, which seemed like a good deal for everybody," Scully explained.

The program he wrote for Robin has gone through "several stages of development." It includes a printer interface, an editing mode that allows the user to move a cursor around to insert or delete text and a print option that allows the operator to print the entire contents of the CRT's message area onto paper.

The user can store notes on an 8K

block of RAM, append titles to notes and unload them onto a cassette tape recorder as well as load them back into the system and control the speed at which the system makes word choices available, Scully noted. Handicapped users can also reply to instructors' questions by putting answers in the RAM or printing them out.

Three Prototypes

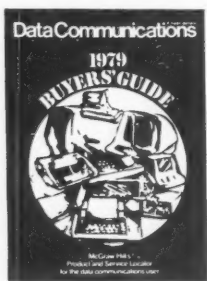
FPI is now making three prototypes of this advanced design, and Scully is "hoping the Veterans Administration will want to place an order with FPI after they have tried them out for a while."

Scully will be very busy when he gets out of prison. His doctoral work at the Humanistic Psychology Institute in San Francisco, undertaken on credit, must be finished and paid for. A job is waiting at the Biofeedback Research Lab at the Langley-Porter Neuropsychiatric Institute at the University of California Medical School, and he is interested in starting another electronics company, he said. Scully had founded one in 1969, but sold it when he entered the penitentiary.

"I definitely plan to continue working on systems communication," he said. "I've corresponded with families of handicapped people who have read about the system."

A copy of the program Scully wrote for Robin can be found in an article published in the March-April issue of *People's Computers*. The magazine is published in Menlo Park, Calif.

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On-Line System Expedites Care of High-Risk Babies

By Marguerite Zientara

CW Staff

LOMA LINDA, Calif. — An on-line single-form data recording and reporting system for high-risk newborn babies has reportedly brought an approximate savings of 80% in physician recordkeeping time per patient as well as data twelve times more accurate than hospital chart data at the Loma Linda University Medical Center's Neonatal Intensive Care Unit (NICU).

The two-year-old system was developed in an attempt to discover what truly constitutes high-risk situations in newborn infants. It also helps determine the effective treatment for such situations, according to Dr. Daniel S. Janik of Salt Lake City, originator of the concept.

In order to study trends in health problems and their treatments, doctors traditionally went through a tedious, time-consuming and expensive process of accessing and reviewing medical charts and other information. With the on-line system, information is recorded and reports generated daily. An abstraction capability allows quick accessing of specific subject areas, according to Kent Henriksen, lead programmer analyst at Loma Linda and co-director of the project.

Paperwork Cut

"Besides aiding medical personnel in retrieving data, the on-line system automatically generates follow-up suggestions for each diagnosis to help encourage consistently high levels of follow-up medical care," Janik noted.

Before the on-line version was implemented, a batch-processed, single-form system was piloted for a year to determine its feasibility and its acceptance by physicians. The batch system attempted to reduce errors by having the individuals most directly responsible for decision making and infant care act as the primary information sources.

"We were aware from other studies that when people use computers to try to determine potential problems by abstracting information from the patient's hospital chart, the accuracy of the data is very poor," Janik said. "So we decided to try and set up a system that would have some kind of short-term benefit for the people who would be gathering the data and reporting it."

In the pilot batch system, a single form, replacing eight chart forms, followed the infant from his entry into the NICU through to his discharge or, in some cases, his death.

The batch system, using the hospital's IBM 370/158 computer, resulted in an improved cash flow and a turnaround time of four to five days from patient discharge to generation of paperwork, compared with 16 to 180 days turnaround time before implementation of the project.

The batch system also resulted in a reduction of data omission and error rates and physician and nurse paperwork-generating time. Further, the time from patient discharge to receipt of discharge information by community physicians was reduced by 67%, from 21 days to seven days.

The success of the pilot batch system

encouraged Janik and his colleagues to go a step further and put the system on-line for even greater efficiency.

The on-line system uses the 370/158 computer as well as an IBM 3278 CRT and an IBM 3270 CRT, each having a light pen device for inputting and updating data. The 370/158 has 4M bytes of main memory, eight tape drives and 200M bytes of disk storage. A 10,000 line/min IBM 3800 laser printer generates reports for the hospital.

Items Recorded

Use of the on-line system begins with the recording of 132 items of demographic, historical, diagnostic and therapeutic information on a worksheet.

Upon admission of the infant, data is transferred by a "project nurse coordinator" from the worksheet to a facsimile terminal screen. The multiple choice answers are entered by light pen. A "Notice of High-Risk Infant Admission" is automatically produced by the computer the following day and sent to appropriate community and health agencies to aid in discharge planning.

In some cases, treatment and diagnosis information is entered at points throughout the infant's stay, which might range from two days to six months.

Discharge information is finally recorded on the worksheet and transferred to the computer. The computer then automatically produces a hospital-approved patient discharge summary for the hospital chart, a set of personalized letters to referring and follow-up physicians and health agencies and the infant transport summary report required by the state.

The time from patient discharge to receipt of discharge information within the community is an average of seven days as opposed to the six months sometimes required before the system was implemented.

System Evaluated

The abstraction system was evaluated after a year of operation by four researchers and several clinicians with extremely limited computer experience.

The average time and cost per manual abstraction were 317 hours — or 40 working days — and \$3,358. The average time and cost per abstraction using the on-line system were two hours and 75 cents. In addition, it was found that less than .8% of the data was missing from the on-line system vs. the 35% of selected data that was missing from the hand-abstracted infant transfers.

Recording and reporting programs are written in Cobol. Data recording is on-line, while report generation and archiving are done in daily or every-other-day batches. All on-line processing is under control of the IBM Customer Information Control System (CICS).

The entire system is now being converted to operate on a microcomputer, with an eye toward possibly marketing it, Henriksen explained. Meanwhile, Loma Linda, a nonprofit hospital, is giving away information and software to interested medical entities.

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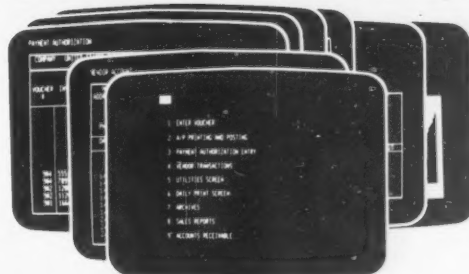
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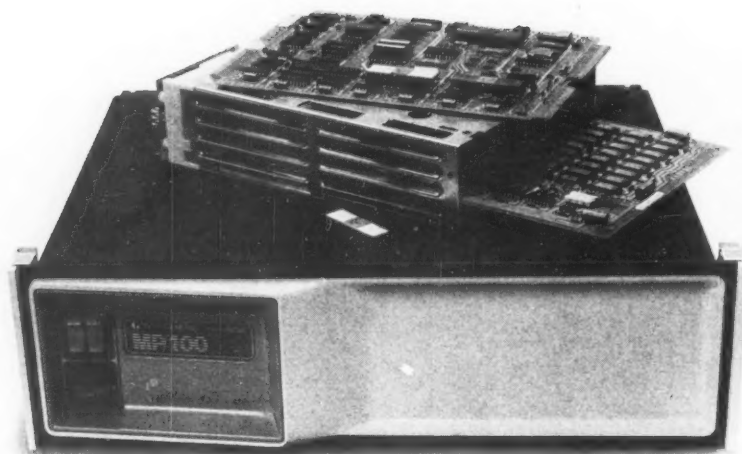
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REQUEST FOR INFORMATION

On March 5, 1979, the Federal Reserve System released a request for information (RFI) to approximately 40 vendors of communication services and products. The following is a summary of the letter used to transmit the RFI:

"The Federal Reserve System provides a number of services for its member banks, certain federal government agencies, and the public through the communication of financial transactions and data. The current melange of Federal Reserve communication networks used to support these services were installed in the late sixties and early seventies. Projections of the future communication requirements of the Federal Reserve System indicate that these networks should be replaced with a general purpose, state-of-the-art distributed packet-switched network. The successor nationwide network is referred to as FRCS-80 (Federal Reserve Communications System after 1980).

The Federal Reserve System considers the marketplace availability survey which the RFI will accomplish to be both a prudent and necessary step in the procurement decision-making process for FRCS-80.

Vendors were invited and encouraged to respond to all, or any part of the RFI. At this point in the procurement decision-making process, the Federal Reserve System is interested in the broadest possible response to the RFI. It is hoped that vendors of commercial communication products and services will respond with information on both complete networks and/or distinct network elements."

The purpose of this public notice is to make potential vendors not well-known to the Federal Reserve System aware of the RFI. If you desire further information, please contact:

Leonard Fernelius
Chairman, FRCS-80 Project Directorate
Federal Reserve Bank of Minneapolis
250 Marquette Avenue
Minneapolis, Minnesota 55480
(612) 340-2328

W. Gary Greathouse
Administrative Manager
FRCS-80 Project Directorate
Federal Reserve Bank of Boston
600 Atlantic Avenue
Boston, Massachusetts 02106
(617) 973-3032

Muscular Action Analyzed With Aid of Mini, Cameras

By Tim Scannell
CW Staff

BOSTON — On a brilliantly lit stage, a series of motion picture cameras and sensitive recording devices capture a budding star's solo performance. In this case, however, the actor is more concerned with walking than with script or plot development.

Barely four years old and light-years away from the glamour of Hollywood, the Children's Hospital Medical Center's computerized gait laboratory here uses 16mm movie equipment and an assortment of medical instruments to document and sometimes correct movement disorders. These motion abnormalities can occur as the result of such afflictions as cerebral palsy, muscular dystrophy and even arthritis, according to Dr. Sheldon Simon, the lab's director.

"Basically, we examine the activities of the muscles when they are participating in movement and the reaction of the body to the surrounding environment," Simon stated. "We look at what added work the muscles have to do to keep a person going, so to speak."

Established as part of a multicollage program to investigate the possibilities of merging the forces of medicine and technology, the gait lab uses a variety of real-time and nonreal-time recording devices to aid in the final movement analysis.

Preparing for the Cameras

Before stepping under the glaring lights and walking before the cameras, patients are attached to an electromyograph (EMG) through a number of surface electrodes placed on major muscles of the body. The EMG monitors the "on" and "off" signals produced by each muscle during movement in much the same way an electroencephalograph (EEG) picks up the electrical impulses of an active human heart, Simon explained.

Ordinarily, the calf muscle will be "on" when the leg is on the ground because it is resisting the pressure of the floor; the muscle will be "off" when the leg is swinging free in the air. However, in a patient afflicted with cerebral palsy, the muscle might be on continuously or switch on and off irregularly, disturbing the normal walking pattern.

As the patient crosses the platform, a highly sensitive scale measures the vertical, side-to-side and backward-and-forward motions of the subject's feet as they react to the pressure on the floor. A built-in forceplate can detect the slightest waver or sway, which could signal a hidden neurological disorder.

"It may look like someone's weight is evenly distributed on two legs, but the plate may show that one leg is actually doing most of the work," Simon remarked.

The EMG and forceplate data — measuring the activities of 16 muscles and three different directions of force on the floor — is input to a Digital Equipment Corp. PDP-11/34 mini-computer front-ended by a DEC LP-11A microprocessor. The analysis of this real-time data paints a medical picture indicating which muscle forces produce which movements.

The real-time data has nothing to do with how well a person walks or whether that person has a great deal of difficulty moving about, however, Simon noted. "The combination of these muscle movements and the external reactions is what produces the movements."

"In the lower extremities, certain things prevent particular kinds of movement because of the ground below," the researcher pointed out.

It's a Take

The motion picture cameras are used to record the patient's physical reactions in relation to the surface of the floor while walking. Because movement is three-dimensional, three cameras are used simultaneously to record the subject's walk from the front, side and an oblique angle.

After the film is processed, it is projected through a Vanguard motion analyzer which presents "a good, non-distorted image" one frame at a time, Simon stated.

Using a Science Accessories Corp. Graf/Pen digitizer, certain limp segments are assigned X or Y coordinates and correlated with the EMG and forceplate real-time data to produce a final statistical portrait. In addition, the computer can produce a series of stick figures or pictographs of a person's walk, detailing the various angles and movements of the corresponding joints.

"The angular changes in graphic form that the various joints are going through on the right and left sides of the body, and the combination of the motions, give us some idea of the effort the muscles have to put out in order to make their moves," Simon said.

The entire analysis, excluding the time it takes to develop the film, takes about five hours. Clinical corrections based on the computerized data are then recommended by Simon or various orthopedic residents.

However, "once we get these [motion] patterns down, we can get the computer to interpret for us," Simon stated.

Simon, an engineer as well as an orthopedic surgeon, commented that very little muscle activity is needed in the normal walking function, but because of the relative newness of gait science nobody really knows how much kinetic energy is necessary.

"If you stood at an ironing board for a given period of time, you would expend more energy than you would walking on flat ground," the scientist stated as an example. "However, even though we have all of this information available which was never available before, we don't have enough experience to set [clinical] patterns."



Calendar

April 1-3, Vail, Colo. — **Spring 1979 DTSS User Group Meeting.** Contact: Pauline J. Cole, DTSS, Inc., Box 799, Hanover, N.H. 03755.

April 1-4, Scottsdale, Ariz. — **Automated Business Communications Conference.** Contact: Jayne Bell, International Data Corp., 214 Third Ave., Waltham, Mass. 02254.

April 1-5, Boston — **37th Semiannual Honeywell Users Group, Small and Medium Systems (HUG-SMS) Spring 1979 Conference.** Contact: Richard McDonald, Treasurer, c/o Mt. St. Mary's Hospital, 5300 Military Road, Lewiston, N.Y. 14092.

April 2-3, Washington, D.C. — **Micro Technology and Management**, sponsored by the American Institute of Aeronautics & Astronautics (AIAA), Data Processing Management Association and Technology Transfer Society. Contact: AIAA Conferences, P.O. Box 91295, Department MPA, Los Angeles, Calif. 90009. Also being held in Boston April 30-May 1.

April 2-3, Chicago — **Data Communications: Advanced Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held April 23-24 in San Francisco.

April 2-3, New York — **Minicomputer and Small Business Computers: Selection and Usage Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held April 19-20 in San Francisco.

April 2-3, San Francisco — **Proposal Preparation and Source Selection**, sponsored by the Technical Marketing Society of America (TMSA). Contact: TMSA Conferences, P.O. Box 91295, Los Angeles, Calif. 90009.

April 2-3, Washington, D.C. — **Microtechnology and Management Conference**, sponsored by the American Institute of Aeronautics & Astronautics (AIAA), Data Processing Management Association and Technology Transfer Society. Contact: AIAA Conferences, Department MPA, P.O. Box 91295, Los Angeles, Calif. 90009.

April 2-4, Washington, D.C. — **Distributed Systems: Are They Right for You?** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran,

N.J. 08075. Also being held April 23-25 in Los Angeles.

April 2-4, Washington, D.C. — **Fighting Computer Crime.** Contact: Technology Transfer, Inc., P.O. Box 49765, Los Angeles, Calif. 90049.

April 2-4, Boston — **Design and Selection of Minicomputer Systems.** Contact: Information Systems & Technology Division, American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

April 2-4, Chicago — **Distributed Data Processing.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

April 2-4, Los Angeles — **Software Engineering — Achieving Quality Systems.** Contact: The Institute for Science and Public Affairs, Continuing

Education Division, P.O. Box 31, Benjamin Franklin Station, Washington, D.C. 20044.

April 4-6, New York — **Data Processing: An Introduction to Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held April 18-20 in San Francisco.

April 4-6, San Francisco — **Data Base Management: A Practical Approach.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held April 18-20 in Washington, D.C.

April 4-6, Los Angeles — **DP Project Management: A Practical Approach.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held April 16-18 in

Chicago.

April 4-6, Washington, D.C. — **Effective Data Center Management.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

April 5-6, Commerce, Texas — **1979 Computer Users Conference.** Contact: Henrietta Gale, Conference Coordinator, Department of Computer Science, East Texas State University, Commerce, Texas 75428.

April 9-11, Washington, D.C. — **Computer Performance Measurement: Tools and Techniques for Increased System Productivity.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held April 18-20 in Chicago and April 30-May 2 in Los Angeles.

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4 PARTITION 4K / HEADER = A015 GROCERY 1		4 PARTITION 5K / HEADER = A015 GROCERY 1
5 PARTITION 5K / HEADER = A016 H & BA		5 PARTITION 9K / HEADER = A016 H & BA
6 PARTITION 4K / HEADER = A017 PAYROLL	4 PARTITION 15K / HEADER = A015 GROCERY 1	
7 PARTITION 3K / HEADER = A018 WEEKLY SALES DATA		
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Student Writes Program, Makes 'Lotto' Dough

By Jay Woodruff
CW Staff

UNIONDALE, N.Y. — Either you buy lottery tickets or you don't. If you don't, you might scoff at Peter Marino, a student here at Hofstra University who does.

But Marino, a senior who expects to get a job working with computers after graduation this spring, has done quite well, including one win of more than \$20,000, in a state-run game called Lotto.

Unlike many of his betting peers, Marino does not gamble with his girlfriend's birthdate or any other "good luck" numbers. He says that method "is not what the machine that picks the numbers does."

One plays Lotto by picking any six

numbers from one to 40 on the Lotto card. The winning numbers are selected by a random process on a weekly television program, so Marino selects the numbers he will play by a random process.

Marino wrote what he called a "very simple program" in Basic that generates 16 sets of six numbers. Each week he spends \$8 for 16 tickets and bets the numbers generated by his program and printed out on the school's Univac 90/60 computer.

On Saturday night, he watches the televised drawing and finds out whether he has won. By Thursday, after the win has been confirmed by independent auditors, the state notifies him of how much money to expect.

Any gambler can eventually have a

winning streak, and one might suppose that Marino had his when he won the \$20,000. But after winning \$41 last week, he is still ahead in his winnings by a few dollars even without counting the big win.

It may be some time before the opportunity for a big win comes again, he indicated, because the \$20,000 win came on the week that the state ran a "special," paying far more than the average.

"I was very lucky to win that particular week," he conceded.

Marino does not appear particularly affected by the windfall, except for the fact that he just picked up a multithousand-dollar programmable synthesizer, an Oberheim OB-1 that he can use for his jazz and disco group,

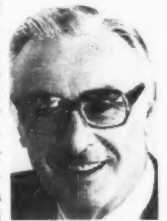
Ovation.

He continues to bet \$8 a week and 54 numbers. Even if he does not win again, which seems unlikely since he has already won three times in seven weeks, it will be many years before he starts to lose any money.

Ribicoff to Speak At 'Top Secrets'

SCOTTSDALE, Ariz. — Sen. Abraham A. Ribicoff (D-Conn.) will speak here at the Honeywell Security and Privacy Symposium, "Top Secrets '79," on April 2.

Ribicoff authored the proposed Federal Computer Systems Protection Act, which would make computer crime a federal offense. The senator chairs the Governmental Affairs Committee and serves on the Finance Committee, the Joint Economic Committee on Taxation and the Senate Ethics Committee.



Ribicoff

Smith and Smoot, Too

Also speaking at the symposium will be Robert Ellis Smith, author of *Privacy: How to Protect What's Left of It* and editor of the *Privacy Journal*; and Oliver R. Smoot, vice-president and treasurer of the Computer and Business Equipment Manufacturers Association.

The symposium will be held at the Registry Resort; the registration fee is \$450. Registration forms and additional information can be obtained from Jerome Lobel at Honeywell, P.O. Box 6000 (M.S. T99), Phoenix, Ariz. 85005.

Intel President Set To Talk Before Astute

AUSTIN, Texas — Gordon Moore, president of Intel Corp., will speak here April 4-6 at the annual spring conference of the Association of System 2000 Users for Technical Exchange (Astute).

Moore, whose company is in the process of acquiring MRI Systems Corp., the developer of the data base management systems (DBMS), will talk on how semiconductor and microprocessor technology advances will affect the data processing community over the next decade.

Registration information is available from Sue Trueblood, Calculon, P.O. Box 290, Germantown, Md. 20767.

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Editorial

A Call for Publicity

The enactment of federal legislation designed to protect consumers from abuse of electronic funds transfer (EFT) systems has apparently not affected consumer perception of this type of service. At least, that is what state-level consumer protection agencies and financial institution regulators indicated in surveys recently reported to the American Bankers Association (ABA).

From the list of eight deterrents to EFT usage considered in the surveys (see Page 9), state regulators of financial institutions found the fear of lost control over personal transactions to be the foremost deterrent, followed by the fear of operational complexity; simple, unqualified fear; safety concerns; and dread of privacy loss.

Consumers are more concerned about security than any other subject of actual or possible EFT legislation, the ABA observed. Consumers have misgivings about the issuance of personal identification numbers and the ability of banks and other financial institutions to safeguard EFT transmission lines.

The so-called EFT Act passed last fall, which requires financial institutions to provide consumers with complete information about the terms and conditions of EFT agreements, is a step in the right direction. This provision is intended to help consumers understand what their usage of EFT entails.

But this is not enough.

Consumers should know what they are getting into with EFT. Accordingly, financial institutions ought to be held accountable for failing to let enforcement agencies and the press know about incidents

of EFT abuse when they occur.

As with other crimes, the names of individual victims could be withheld to avoid possible embarrassment or harassment. The methods of security breaches could — and, in most cases, should — be withheld to avoid further breaches.

But the public should know how many incidents of EFT abuse occur in a given year so they can intelligently discuss the prevention or deterrence of that abuse through legislation.

Moreover, the public has a right to "comparison shop" in the EFT marketplace on the basis of the security, indicated by each EFT service provider's breach history. An EFT customer should know how vulnerable some of his most sensitive data is to unauthorized disclosure or tampering; such statistics seem at least as important as tar levels in cigarettes or gas consumption benchmarks for automobiles.

Full disclosure of the rate at which various EFT providers experience breaches or the rate at which transmission errors occur would have a much more positive impact on consumer acceptance of EFT than the EFT Act, since providers would be spurred to shoring up weaknesses in security. At present, many EFT customers still do not realize the EFT Act exists.

Financial institutions are currently not inclined to report or prosecute cases of EFT crime because they fear adverse publicity. But other industries endure well-publicized stories of product performance failures.

Why should EFT providers have it any differently?



Letters to the Editor

What's Happening With IBM 4300 Orders?

Hey. Something very funny is going on out here in IBM Land. I wrote a letter to our IBM sales rep on Feb. 9 (first day of 4300 First Day orders, notice) ordering a 4331. Since I have yet to convince my organization of the wonderfulness of replacing our 370/115, it was understood that this order was not binding. I was just getting in the queue.

Or so I thought. On Feb. 23 (one week prior to the closing of First Day orders), the sales rep presented me with a piece of paper which had to be signed or else the order would not have been entered. The paper said, in effect, that I am really honest-to-goodness cross-my-heart getting this equipment for my own use, that I'm not fronting for the little old lady at the corner grocery, that I won't speculate on the delivery date (whatever that means) and a raft of other things of that nature. Fortunately, it didn't insist that we get rid of our PDP-11, too.

Well, I certainly will speculate on that piece of paper, folks. Isn't it odd that a manufacturer should extract promises of intent of use of its merchandise? What if they made you promise not to put Q-Tips in your ears or else they wouldn't sell them to you?

Is this legal? What if you say you won't, but then you do? Somebody comes with a warrant and takes all the Q-Tips away? Is that legal?

Somehow this does not strike me as the proper way to treat customers—especially customers in good standing for more than 10 years. I do not take kindly to such foolishness.

Considering all the IBM-compatible hardware available and since IBM doesn't appear interested in our business, I'm sure other manufacturers will be happy to sell us their computers. Just be-

cause someone wrapped a piece of cotton around a stick first doesn't mean he is the only one who knows how.

E.G. Johnston

Westminster, Md.

User Dollars Swallowed

Congratulations to Ben Moyle for his comments regarding DOS/VSE [CW, Feb. 26]. It is rare to find someone who legitimately takes IBM to task right at the time of an announcement.

The part he missed in his analysis is that once again IBM users will place their names in the IBM "delivery lottery." They will accept delivery of their 4300s without realizing how many dollars will be spent dumping existing applications and systems software.

Many companies that were well on the way to converting to OS will now spend six to 12 months converting to DOS/VSE. They will gain marginal improvements which they could have gotten 12 months ago from any software vendors selling similar and better operating system enhancements.

The difference between the independent offerings and IBM's is that the independents offer compatibility with Isam, DAM, Vsam and all other applications and systems software.

Moyle failed to point out that significant applications software such as the major CIF, insurance and MRP packages as well as most of the "home-grown" and independent file management and data base systems will have to be converted.

As an independent company that markets both systems and applications software, we view the IBM announcement in a much larger context. Users should recognize that money saved on hardware will be reapplied to IBM in software fees.

Michael W. Rohrbach
International Marketing Services
Wellesley, Mass.

Data Past

Five Years Ago March 13, 1974

CHICAGO — MCI Telecommunications Corp. filed an antitrust complaint against AT&T charging that AT&T and its 24 operating subsidiaries "exploited control of local telephone exchange service in order to prevent MCI from competing fairly and fully with AT&T's own long lines department."

WASHINGTON, D.C. — According to a report prepared by the General Accounting Office for Sen. Sam J. Ervin's Senate subcommittee on constitutional rights, the Federal Bureau of Investigation was apparently involved in a power play with the Justice Department to centralize its control over all nationwide computer/communications systems used for law enforcement.

Eight Years Ago March 17, 1971

A new growth area relating to computers within the next 10 years would be lawsuits against computer companies, attorney David H. Greenberg reported. He blamed this situation on very low standards and levels of performance in the computer industry and lawyers' general misunderstanding of the industry, its terms, standards and inner workings.

WASHINGTON, D.C. — The Department of Justice investigated an allegation by San Francisco Mayor Joseph L. Alioto that disclosures from confidential files of the department and other government agencies were made illegally to Look Magazine.

Reader Commentary

Editorial on IBM 4300 Flawed by Bad News

By Bennet I. Moyle

Special to CW

The "Good News, Bad News" editorial [CW, Feb. 12] on the IBM 4300 line was bad news. I believe it was flawed in the following respects:

- Although it was indicated that the 4341 offers 3.2 times the processing power of a 370/138, the editorial compared the pricing of the two systems. It is more appropriate to compare the 4341 to a 370/148 or a 158 (the 4341 performs between them) or to multiply the 138 price by 3.2 for comparison purposes (over \$1 million).

- The software pricing, contrary to being bad news, is insignificant to the decision process. It is less than 15% of the 4341 CPU cost.

If there is any bad news, it's the potential effect of this kind of pricing on independent software vendors, who have taken good care of DOS users to date.

- Hopefully users know better than to compare (software) rental prices to (CPU) purchase prices without considering the time value of money. The cost in interest, whether paid on a loan or lost from income, on the

\$100,000 difference between a 138 and a 4341 will be over five years much more than the software cost.

- Many users are spending more now for DOS/VS enhancements from independent software suppliers for functions included in the new software (DOS/VSE) than the price of the new software, so it is not really an additional cost. It may even constitute a software expense reduction.

- In general, the editorial did not consider the value of the software as a part of the decision process. The functional and performance enhancements incorporated in DOS/VSE are easily worth their cost.

- Most important, DOS/VSE may be installed on current 370 systems. For that matter, the new CPUs can be operated under the existing DOS/VS software in what is referred to as "370 mode."

The software decision is therefore properly an independent one. In practice, most users of DOS/VS will install DOS/VSE regardless of their CPU, because of the enhancements and be-

(Continued on Page 32)

Reader Commentary

Book on 'The Consultant' Shows Anything Possible

By Joe Rigo

Special to CW

The *Consultant* is a novel about computer crime. It is strictly entertainment. Programmers should love it. People on the company security staff won't like it at all.

Without trying to be serious, the book makes one point very clearly: The top technical guy in a data processing shop can get away with just about anything.

The *Consultant* was published last year in hard cover by Coward, McCann & Geoghegan. Its author is John McNeil, a veteran of more than 18 years in the computer field, mainly in Europe.

McNeil obviously knows his way around a corporate systems department. He knows the people, and he knows what they do all day.

His book reeks with the technical details of the programming world. For example, his criminals like to carry out their misdeeds by altering the object code in the load or core image library. In this way, their changes won't show up in the compiler listings.

The action takes place at a large commercial bank in London. Several people are trying to rob

the place blind, and some of them make very good progress.

The main character is a former IBM salesman named Christopher Webb. He is a specialist in detecting computer crime.

Clients like Webb because they believe he is able to think like a criminal. They are quite right. When he finds a programmer channeling company funds into his own account, Webb characteristically turns the guy in and collects his fee.

Before leaving, though, he alters the program so that it will keep on working, but with the money going into a new account that Webb sets up for himself.

Some of the technical details don't stand up. McNeil is writing a novel, not a programming manual. It doesn't matter. The author clearly knows his subject.

He is like Kurt Vonnegut in one respect. There are no heroes or villains in his book.

There are bank directors and bank robbers. But McNeil does not judge them. He simply describes what each of them does to get through his day.

Programmers seem to come off better than managers, but the

(Continued on Page 30)

The Taylor Report

A/R System Hits Errors, Keeps Customers Happy

By Alan Taylor

Special to CW

It is an ill wind that blows no good, the saying goes. While my wife was recuperating from her recent heart attack, our daughter — on top of schoolwork — took on the tasks of paying bills and keeping the house running. I didn't have time to supervise, so some of our bills may have been paid in an unusual manner.

As a result of this change in schedule, I learned that behind every accounts receivable (A/R) system, there should be an "A/R?" system. Fingerhut Companies, a mail order firm in Minnesota, has such a system.

An A/R? system functions to keep the files accurate and occasional customers happy. Accounts receivable, in many situations, is not an automatically self-correcting system. Small amounts may be left standing for months — even years — particularly in retail or mail order operations.

A good DP operation needs accurate files. It should be able to pinpoint in a timely manner where errors are occurring in any part of the operation. Computers can be a valuable management tool in this way.

An A/R? system scans for such

problems. It goes through the files of recent transactions and checks them against possible transactions, not limiting itself to account balance data alone.

In the past, Fingerhut has reviewed its customers' files by employing pleasant marketing concepts. It noted birthdays and issued "President cards" when prompt payments were made.

If the customer had not ordered merchandise for a year, the firm sent out a pleasantly worded comment saying that mailings would be stopped shortly.

Last October, before my wife's problems arose, we ordered some merchandise and intended to pay in full upon receipt of the bill. Fingerhut always offers an installment plan for payment, but if you are careful, you can buy at the basic price.

Invoices are sent out in the form of installment books. If the price isn't paid in full when the first installment is due, the customer is thereafter charged the full interest.

In our case, the computers found one payment totally missing and five others paid in full including interest (which I don't think we had ever paid before). The account was marked as containing a poten-

(Continued on Page 30)

The Human Connection

Federal DPs to Debate Job Standards at Expo

By Jack Stone

Special to CW

What is shaping up as a major debate over job standards for computer personnel will be taking place at the Fifth Annual Federal DP Expo in Washington, D.C., at the Sheraton Park Hotel on March 21. It's scheduled for the afternoon in a session entitled "Working Within the Civil Service Reform Act."

The opponents at the verbal shoot-out are expected to include Dave Gilmore, who is responsible for developing tentative standards for the computer specialist job series in the U.S. Office of Personnel Management (OPM), formerly the Civil Service Commission, and Dave Skeen of the Office of Naval Research, who also serves as president of the Federal ADP Users Group (Fad-pug), a quasi-formal interagency ADP committee.

The background to this story — which of itself tells something about the progress of the federal government in understanding the nature of computer systems activities — is told in the report of the personnel team assigned to the president's reorganization project for ADP [CW, June 5].

The major finding of the report

was that the then-current standards were way out-of-date and did not adequately reflect the many technical and supervisory specialties in the field. For example, the report noted, standards for programmers and analysts were set in 1958, combined into one classification in 1967 and remained essentially the same until now — the major exception being the formation of the computer scientist series in 1977.

New job specialties, not separately identified today within the government, include telecommunications, systems programming and information systems.

Meanwhile, back at the personnel department ranch at OPM, an intensive effort was under way to build a set of standards for "computer specialists" — government jargon for programmer, systems analyst and equipment analyst personnel. A draft was disseminated requesting comments by Jan. 22.

After describing the job series in five different ways (which tends to defeat the purpose and build confusion instead), the writers correctly noted that the chief difficulty in constructing the standards was the "project

(Continued on Page 32)

To Increase Skills

Edpaf Project Developing Base for DP Audit

By Martin L. Bariff

Special to CW

Previous comments on systems auditing by Michael Bingle [CW, Dec. 25-Jan. 1, Feb. 12] and Howard A. Karten [CW, Jan. 15] reinforce the current need for a clear understanding of the DP audit function.

Sample job descriptions have been proposed by the EDP Auditors Association, the ADP Audit Group in the General Accounting Office (GAO) and the Institute of Internal Auditors (IIA). None, however, have received general acceptance.

The research Division of the EDP Auditors Foundation (Edpaf) is conducting a project to develop a com-

mon body of knowledge for DP auditing. The two major objectives are to identify what skills and

ing contributions.

The common body of knowledge will be completed by this summer and thereafter biennially revised. It will help DP audit managers select personnel and provide guidance for continuing education needs.

This study emphasizes identifying skills which the DP auditor should possess. It complements the IIA's Systems Auditability and Control (SAC) study, which identified skills DP auditors presently possess.

The project committee is composed of Joseph Aicher of Sun Information Services, Gordon Davis at the University of Minnesota, John Festa of American Express

Co., John Nuxall of Peat, Marwick, Mitchell & Co. and myself. Members of the project advisory board represent internal and external DP auditors, the GAO, universities and industry financial management.

Four tentative major responsibilities of DP auditors have been identified by the project committee:

- To evaluate the adequacy of controls and test their operating effectiveness for system and application development, implementation and maintenance, data bases, program libraries, data center activities and remote data entry display.
- To evaluate the efficiency of DP production activities.
- To evaluate the effectiveness of DP administration, e.g., financial planning/control and user satisfaction.
- To assist financial auditors to conduct financial audits.

Both DP and financial auditors share a concern over the quality of DP system output. The financial auditor, however, places greater emphasis on DP system output conformity with generally accepted accounting principles.

In contrast, the scope of a DP auditor includes financial, physical and text-processing quality. Thus, all numerical and nonnumerical data which passes through a DP system should conform to financial, operational, security and privacy controls promulgated by management and regulatory agencies. Subsequently the data should be verified by a DP auditor.

Computer Wisdom Needed

Effective DP auditing requires extensive computer knowledge. Adequate application controls can be compromised by insufficient system controls. Thus, it appears the transition to DP auditing is easier for a DP professional.

Furthermore, the increasing complexity and dynamics of DP technology require DP audit specialists, e.g., operating systems, data bases and networks.

DP auditors should retain the "audit" identification in their job titles. Auditing is a universal term — verification of activities in conformance with stated policies and procedures.

DP auditors need to clearly differentiate their domain of interest from that of financial auditors. Favorable responses to the Certified Data Processing Auditor (CDPA) program by both internal and external DP auditors indicates a broad interest in retaining the term, "auditor."

The application form for a CDPA during Phase I, Professional Experience Provision, which ends June 30, identifies nine areas of acceptable DP audit expertise. Interested parties may reach Stan H. Barnes, director of certification, at the Edpaf Administrative Office, 7016 Edgebrook Lane, Hanover Park, Ill. 60103.

Bariff is the director of research at the University of Chicago's graduate school of business in Chicago, Ill.

Reader Commentary

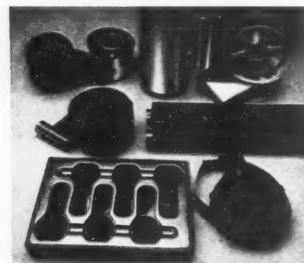
knowledge a DP auditor should possess and to develop DP audit curricula for universities.

The project is funded by the Certification Division of the foundation and the Bank Administration Institute. Selected hardware and software vendors are considering mak-

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Auditors Need More Than DP Grounding

By Frank J. Winters

Special to CW

After reading "Most Systems Auditors Not Experts in DP" [CW, Jan. 15], my initial response was, "Huh?" While it is true that audits of computerized systems have often been done by people who were not experts, there are several points in the article with which I take issue.

The current trend in DP auditing is to recognize the need for DP expertise in today's computerized systems environment. In the absence of such expertise, most auditors have the sense to audit around the computer.

Today, most auditors who audit the computer function are either trained in DP technology or painfully aware of their lack of knowledge.

Review, Control Functions

Internal auditors who find themselves in an adversary relationship with those they audit have generally made several mistakes. The internal auditor's role is to provide a service to management by reviewing operations and serving as a control which reviews other controls.

Fraud is not the auditor's only concern. While always aware that fraud may take place, the auditor reviews the adequacy of controls in place to prevent or detect fraud.

If control weaknesses are found, then the auditor may follow up to see if these have allowed errors to occur or fraud to be committed.

The vast majority of audit procedures are designed to test the adequacy of internal control or the effectiveness of operating procedures. Today's internal auditor is an internal consultant to management and spends most of his time doing operational audits.

The auditor who "puts people off" is probably not doing a good job of serving management or reviewing

controls. The internal auditor is part of the same corporation as the auditee and, as such, supports the same corporate goals.

Prevent Patches

As to what an auditor thinks about patching programs through the console, I think (as an auditor) it should never be allowed.

Policy and practice should prevent patches of this kind. In today's operating systems environment, these patches are either difficult or impossible to make. Even in the relatively simple environments of the past, patches required a fairly high level of expertise.

With this as background, however, I believe most policy can be broken

given an urgent need. In such a case, the event should be approved by the proper management personnel and, most importantly, documented. Once the urgency has passed, the proper technique, ac-

Nonetheless, those who receive notification that a system under their control is to be audited are not amused.

I have been working in support of the DP audit function for six years and have a reasonably good background in DP. I think I am a competent DP auditor, and I know others who are equally competent. I also know some incompetent DP auditors.

But guess what: they also have good DP backgrounds. Maybe they think auditing is a joke or they job is to put people off. Maybe they don't understand auditing.

Winters is a senior internal auditor with AT&T in New Brunswick, N.J.

Reader Commentary

cording to policy, should be applied.

Those who view auditing as a joke probably have never been audited. Some auditors may be comical. Others may be incompetent. Frauds may exist that go undetected.

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HEWLETT  PACKARD

Book Shows Anything Possible at DP Site

(Continued from Page 25)
margin is small. McNeil seems to respect anyone who is good at his work. He especially admires anyone smart enough to modify an operating system for illegal purposes and get away with it.

This is the part that should make the security people nervous. No one is going to copy the scheme in this book. It wouldn't work. But it seems there must be similar ways of tackling the problem that would work quite well.

Most installations realize the threat exists, but they feel they must live with it. Every shop has at least one systems programmer who can walk up to the console at any time. He twists some dials, runs

some programs and walks away without ever explaining anything to anyone.

No one knows what he did, and no one is going to ask him. They count on him to keep the shop running.

It is impossible to read a book like *The Consultant* without wondering how much undetected crime is going on. No big cases of this sort have been reported publicly. Still, it may be that the people who chase thieves don't like to read core dumps.

It is clear that the cost of investigating computer crime at this level is prohibitive — unless there is a strong suspicion that cannot be ignored. The time requirement is enormous.

Also, the detective must be as sharp technically as the criminal. There are few organizations that would be able to keep this kind of person in routine security work. There are too many hot development projects that need talent.

The book, of course, doesn't go into any of this. It is simply a good action-adventure story. The plot

moves fast, and the characters stick closely to their business.

The story probably has too many technical details for people outside the computer professions. For the rest of us, it is a nice tale about our field and — just maybe — about the people who work around us.

Rigo is president of Sysdoc, Inc. in New York City.

A/R System Spots Errors

(Continued from Page 25)
tial error. I still don't know whether the interest was due since I wasn't notified what date payment was received.

So far, this was little more than one

would expect from any really sharp system. Then came the breakthrough. Fingerhut added the customer into the loop and did it very well.

The output is a nicely composed letter with brief, simple statements about each individual purchase. The statement, "no balance due at this time," is incorporated into the letter. The mailing simply asks, "Is this really right?" It is up to the customer to respond after he is given a push to look carefully.

Improvements are possible. The firm asked the customer to return the letter after making comments on the back. It could have suggested that the customer make a copy of the letter or at least write out careful references for his own records.

The delivery date, rather than the invoice date for the merchandise, would be helpful — even a statement of the relationship between the dates. The date of payment and whether the payment was received in time to avoid the interest should have been noted. But these are minor points.

The important point is that Fingerhut is running the first, real second-generation A/R system I have seen.

Regarding the Feb. 26 column, the last day to be considered for "Smart" paint test site selection is March 23.

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Just Another Stereotype

Just what professional women need: a new stereotype in addition to the ones we already have to fight. In the Feb. 19 *Computerworld*, Ida Mason reported on the latest refinements of pop psychology: now women DPeres are not "passive," but "afraid to take risks."

These conclusions will be welcome in many a corporate boardroom. How many companies will admit to being so "conservative" that they can afford to promote a woman who, according to the very latest studies, will turn chicken when the going gets rough?

The "quick and dirty" vs. "do it right" argument must be one of the oldest and most common controversies in DP development, and it has nothing to do with sex. The conflict concerns expediency vs. quality; men and women may be found on both sides of the fray.

The problem with pseudo-science is that, behind all the jargon, it usually serves to reinforce the stereotypes we already have. One thing is certain: in the argument between the hypothetical male and female programmers, I know whose project I would rather inherit.

Jocelyn S. Linnekin

Evanston, Ill.

A Number of Mistakes

We are appreciative of the story on the Harlem Opportunities Industrialization Center of New York, Inc.'s Computer Training Center that appeared in the Jan. 22 issue.

It appears, however, that the instructors, our DP professionals, were not interviewed, and therefore a number of inaccuracies and errors were reported in the article.

First of all, the computer center is not located in a high drug use area. The area no doubt is depressed and consequently has its fair share of sociological ills, a drug culture included, that characterize any number of urban areas that are identified as being depressed. The real problems are unemployment and abandoned buildings.

Although the telephone lines for the computer center have on occasion been ripped off, it is in no way a chronic problem that occurs on a monthly basis. As far as we have been able to determine, the wires have been ripped off not just by junkies, but people who are simply unemployed and probably unskilled.

As to the length of the programming classes, students attend a minimum of 16 weeks. The length of classes is virtually dependent upon the needs of students to ensure they leave our educational environment with marketable job skills in the areas they have been trained in.

The statement that more than 40 companies have hired our graduates is a bit misleading, for the 40 companies mentioned in the article actually refer to those companies that have hired our students only within the past year, from July 1, 1978 to the present.

It was not accurate to report that the IBM 3275 CRT, which is on-line to the System/3, is not presently in use. We do use it in training students, and it is becoming a more in-

tegral aspect of the training process. We do not at all have a 9610 data recorder.

Finally, we are looking to upgrade from a System/3 Model 10 to a System/34, not another model of the System/3.

Larry S. Sampson
Branch Manager

Opportunities Industrialization
Center
New York, N.Y.

Ironic Attack

Until now I have read with interest Dick H. Brandon's anti-facilities management (EM) campaign. My fascination hasn't been generated

by the content of his misinformed attack, but more by the relatively large amount of print CW has devoted to such asinine commentary.

In regard to his most recent self-defense and attempt at setting the record straight in the Feb. 19 issue, how can a service with revenues in sight of \$1 billion per year have "no inherent viability"?

Profits made by outside FM organizations do not have to come from increasing costs. Profits can be made by applying resource management techniques to inflexible DP organizations locked into extravagant budgets considered a necessary evil. Such waste elimination can yield profits to the FM vendor

as well as savings to the client.

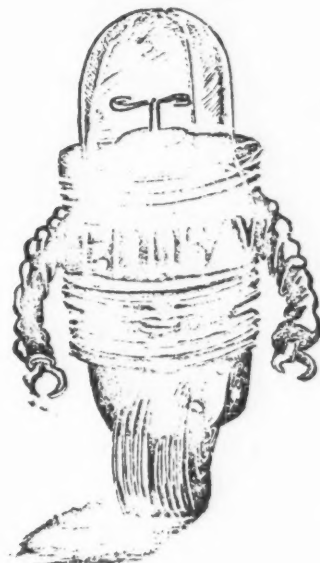
Staff loyalty to an "outside" firm and long-term career objectives with that firm are viewed by Brandon as a negative. I find this amusing in that the greatest mobility available to a professional DPer is not through loyalty, but through the employment ads.

In agreement with Brandon's point that most DP failures can be traced to management failures or lack of concern or involvement, why not subcontract this involvement with a defined scope of effort for a defined fee? Perhaps Brandon's checklist of 170 items would indeed be useful.

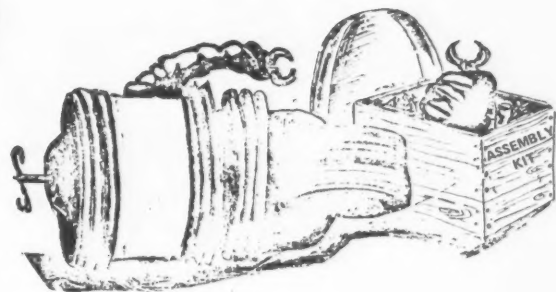
Finally, is it not ironic that the president of a consulting group suggests that solutions to management problems cannot come from outside?

J. F. Zavar

Bethlehem, Pa.



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PRODUCTS FOR PERFORMANCE

Federal DPeres Set to Debate Job Standards

(Continued from Page 25)
nature of the work." (This is an acceptable euphemism for the helter-skelter staffing of ad hoc projects operating in panic mode).

But they moved forward anyway and performed heroically by evaluating the positions in terms of the "most representative level of work performed," which is probably all anyone could do.

One particularly interesting aspect of the standards pertains to those elements which should not be considered when grading positions, a perspective which rightly or wrongly runs orthogonal to industry practice. These elements include "operating mode" (real-time, batch and so forth); generation or brand

of equipment; nature of the automated work process ("clerical, scientific and so forth"); data base size; and "ability to interpret technical data or ability to communicate."

The writers agreed, however, that these elements may be critical in accomplishing the work. However, "because of problems such as simultaneous occurrence at several grade levels, they have been omitted from the grading criteria."

The standard includes an exhaustive description of the factors used in assigning grade levels to 19 different computer positions, taking into account knowledge, supervisory "controls," "guidelines," complexity, "scope and effect," per-

sonal contacts, purpose of contacts, physical demands and work environment.

Broaden Standard

On Jan. 19, Fadpug, through its special interest group on career development and training, sent comments to OPM expressing considerable concern over the contents of the proposed standard. The users argued, for example, that the combination of specialties into a relatively small number of groups was "inconsistent with the growth and direction of the DP field."

Specifically, they recommended broadening the standard to include specific knowledge and skills needed in the highly technical

areas.

They took issue with the exclusion of the operating environment, saying, "While this might have been appropriate several years ago, it certainly isn't today. The true complexity of systems should be considered in determining the level of knowledge."

They also observed that the standard included little in the way of formal educational prerequisites for certain positions. "Data processing is still a relatively new and changing field and, as in any new field, talent is initially grown on the job so that knowledge and skills are acquired slowly and painfully through experience," they said. "Fortunately, these days are over and knowledge and skills can be described, defined and learned through education and training."

Well, it may not equal the Lincoln-Douglas debates, but it should be interesting.

4300 Editorial Only Bad News

(Continued from Page 25)

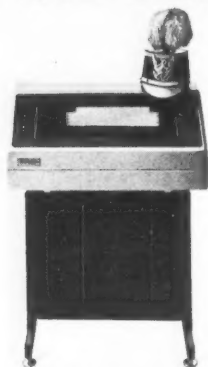
cause support for DOS/VS will eventually be dropped.

It's true that the 4300 pricing will effect the prices of used 370 machines significantly. It will probably do the same thing to the alternative vendor machines. That will be a factor in acquisition decisions, but it is not a new phenomenon.

And I disagree with the editorial's conclusion: "The 4300 systems look at first blush like the best price performers in the mid-range IBM-compatible marketplace." They look like the best price performers also at the second blush. The decision calculations will be easier because the numbers are smaller.

Moyle is president of B.I. Moyle Associates in Minneapolis.

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Available Free to Users Center Offers Software Project Data

By Don Leavitt
CW Staff

ROME, N.Y. — Factual information about the effort spent to build and then maintain large-scale systems is being gathered by the Data and Analysis Center for Software (Dacs), recently established at the Rome Air Development Center (RADC).

Perhaps even more significant than Dacs' gathering such data, however, is the center's plan to distribute it free to "anyone who wants it and can tell us what he really wants," according to Dacs manager Lorraine Duvall.

The major function of Dacs is to develop and maintain a computer-based data base of empirical data on the development and maintenance of software and then to produce and distribute subsets of the data base. But it is also expected to maintain a software technology information base of technical documents, project status informa-

tion and evaluation data and to analyze the data and information and produce technical reports, Duvall said.

Dacs is also expected to maintain an "awareness" program which will include dissemination of technical information, assessments of technological developments and publication of a monthly newsletter. Still other goals include developing and maintaining a glossary of software engineering terms and providing rapid response to inquiries for technical information, the manager noted.

Seven Data Bases

The Dacs data base presently consists of seven distinct data sets. The first six contain data describing software problem reports (SPR) acquired by RADC from six large software efforts. The application areas encompass command and control, real-time control of land-based radar, on-board guidance and navigation and data base manage-

ment.

Most of the data sets contain the date the SPR was opened and closed, the software module that manifested the problem, the module that was changed to correct the problem, the problem category and severity and the correction type, Duvall continued.

Three of these six data sets contain module descriptive information — the number of source instructions, the programming language, the type of construction — and a functional area designation. One data set records information on each test run.

Data from these first half dozen data sets has been used in various software reliability analyses. According to Duvall, the general conclusion of the studies has been that more data is needed to compare results across projects and that higher quality data had to be collected during the development of the software.

The seventh data set, compiled by RADC, contains summary information from more than 400 projects. This includes project and company name, the programming language used and the percent of utilization, the number of pages of documentation and the number of lines of source code delivered, the total number of man-months and calendar months, the number of software problem reports, an SPR and productivity rate and the type of technology used — i.e., structured code, top-down programming, etc.

Plans are presently being formulated to incorporate into the Dacs data base the project descriptive, failure and correction information from the Software Engineering Laboratory at the National Aeronautics and Space Administration's Goddard Space Flight

(Continued on Page 34)

RPG Compilers, Runtime Aids Exercised by Test Routines

ORANGE, Calif. — A package that provides comprehensive testing of RPG-II systems designed for IBM System/3 compatibility is available from Panatec, Inc. The package contains 200 programs with 19,000 source statements and data records.

Tests are segregated into three categories. Fifty-five programs in the package produce 300 different error conditions which should be detected by the compiler, and 125 compile-and-execution test programs exercise both the compiler and the runtime. The latter test all RPG-II statement types and operation codes ranging from nominal to extreme operating conditions.

System performance is tested by 20 programs representing two typical RPG-II applications: a mailing list and label generation application and a production accounting application. A demonstration program is also included in this portion of the package.

The system performance group includes approximately 7,500 test data records along with 2,300 program statements.

The Panatec RPG-II Test Package is documented with a written test procedure describing the operation of the programs and listings of the programs together with results produced by the IBM System/3 Model 10. For the system performance programs, timing results from the System/3 are included.

The package of source programs and test

data is available on 80-column punched cards that contain the necessary OCL directive for System/3 operation. Alternately, it can be delivered on magnetic tape with OCL directives removed.

The cost for the RPG-II Test Package under a one-time licensing fee is \$10,000. Documentation and two sample programs are available for \$25. Panatec is at 1527 Orangewood Ave., Orange, Calif. 92668.

Monitored Data Archived

ST PAUL, Minn. — The Comtem, Inc. Performance Data Base was designed to summarize, store and visually report data collected by the company's Dynaprobe hardware monitoring systems. It is an optional enhancement to the existing Dynapar performance reporting software, a spokesman noted.

Dynapar is the data reduction software provided with the Dynaprobe monitors. Dynapar output represents the system performance during the monitoring period; the reports provide statistical data on the frequency or duration of measured or derived system events.

The Performance Data Base is particularly useful in supporting long periods of monitoring, the spokesman said. The data collected during monitoring allows the user to project system growth and increase system

efficiency. This long-range planning of system resources permits the user to control his DP costs, he added.

Designed for ease of use, the Performance Data Base features a simple control language, flexible data selection and reporting and safeguards for data protection, he said.

Although the original Dynapar runs in a variety of environments — including IBM, Burroughs Corp., Honeywell, Inc. and Univac — the Performance Data Base is only available "at this time" to IBM 370 users running under OS/VS and MVS. In the IBM setting, the data base and its supporting programs require approximately 280K bytes of memory.

The Comtem software is available for \$2,800 a year or \$250/mo if rented on a month-to-month basis. Comtem is at 1950 W. County Road B-2, St. Paul, Minn. 55113.

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Translator Transferred

MILWAUKEE — The RPG-to-Cobol Translator program from Dasd Corp., previously available only for IBM-based installations, has recently been adapted to run on a Burroughs Corp. B6700.

The Translator itself is written in PL/I and the changeover took "some effort," a spokesman commented. The software now accepts "any type of RPG" source code as input and produces, in this instance, equivalent Cobol source code that can be compiled and run in the Burroughs environment.

The generated Cobol is said to be well-annotated, modular coding that is easily understood and maintained. The translation is very nearly 100%, the spokesman said.

Programmers can easily rework the unconverted logic before the Cobol is compiled, he added.

No Problem

Producing Burroughs-compatible Cobol was no real problem since earlier IBM-oriented translators had offered such output as one of several options.

Others included Cobol for Honeywell, Inc., NCR Corp., Prime Computer, Inc. "and of course IBM" systems, the spokesman explained.

The Burroughs-based Translator is available under usage or license agreements. It costs \$15,600, the Dasd official said from 9045 N. Deerwood Drive, Milwaukee, Wis. 53209.

Remote CPU-to-CPU Link Enhanced in DTSS Update

HANOVER, N.H. — The Datalink remote computer interface system built into the Dartmouth Time-Sharing System (DTSS) has been enhanced in speed, protection and flexibility, according to a spokesman for DTSS, Inc. The DTSS software was built for large-scale General Electric (now Honeywell, Inc.) mainframes.

The system offers the user time-sharing for interactive processing; a background batch system including interactive checking; a job description syntax; a set of editors; a secure common file system; a sort system; a graphics package; and an "extensive" system development and maintenance

facility, the spokesman recounted.

Datalink, one of the support capabilities offered by DTSS, permits CPU-to-CPU exchange between DTSS systems and others, including IBM 370s. Datalink sends JCL statements, programs and data to the second system over a synchronous phone line, then monitors transmissions from the second system, inspecting output and distributing it to disk files accessible to the DTSS user.

One of the Datalink enhancements is said to be increased speed because of blank suppression, resulting in the transmission of fewer characters. But the subsystem also has added protective measures which prevent the loss of data in the event of transmission line failures, the spokesman noted.

It also provides increased flexibility in the parameters controlling the link, simplifying communications with other types of systems, he said.

DTSS runs on a Honeywell 6000 series on a Series 60 Level 66 mainframe with a minimum 192K words of memory and three disks. A minimum DTSS package, including operating system, Datalink and both Basic and Fortran, leases for \$5,500/mo.

DTSS, Inc. can be reached at 10 Allen St., P.O. Box 799, Hanover, N.H. 03755.

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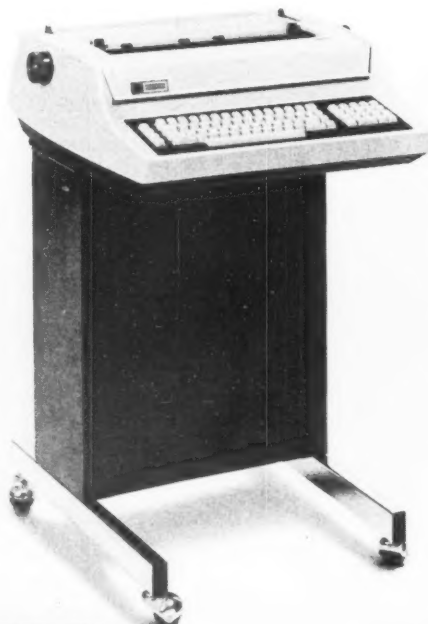
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Center Offers Software Data

(Continued from Page 33)

Center, Duvall added.

The first step in obtaining the desired information or literature search is to provide Dacs with a clear request. Personal visits are welcome; telephone calls are accepted, but written requests are generally much more satisfactory, the manager commented.

The request should identify the primary topic of the search and have a narrative description of the particular facets of the prime topic the user wishes emphasized.

Inclusion of keywords as well as the use for which the information is sought can be valuable in formulating the query, Duvall said. Areas closely related to the primary topic but in which the user has no direct interest should be identified, she added.

For the time being, access to the Dacs data base is available only through the center's staff. It is much too early to tell whether direct on-line access to the data will be offered, she said.

The no-cost policy is based on two considerations, according to Duvall. First, the information and specific data available is still limited compared with what she hopes it will be in time.

In the second place, the center is being operated under contract by IIT Research Institute. It is therefore fully funded, and the concern now is to determine how much interest there is in the information and data it wants to provide, rather than in whether it is a profitable venture.

Requests for more information about Dacs or requests for information from the data base itself should be directed to Duvall, Dacs Manager, RADC/ISISI, Griffiss AFB, Rome, N.Y. 13441.

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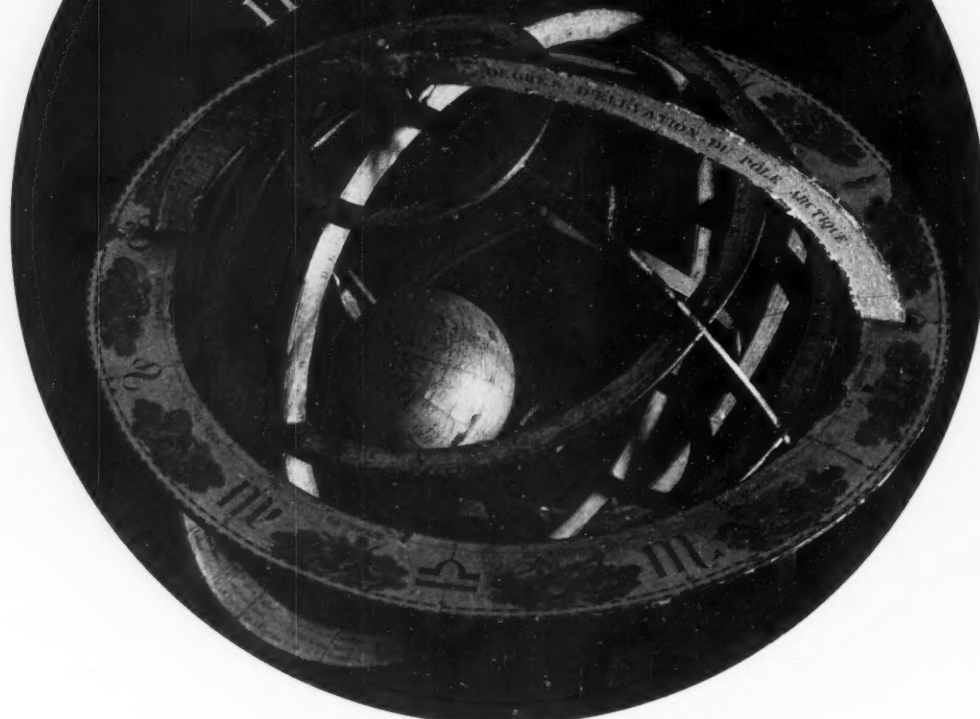


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Audit Facilities Tied To 'DYL-260' Logic

ENCINO, Calif. — DYL-Audit from Dylakor Software Systems, Inc. combines packaged auditing and accounting functions with the report writing and file management facilities of the company's DYL-260, allowing the auditor or programmer to function effectively and independently, the vendor said.

The combination provides such capabilities as sampling, aging analysis, frequency distribution and letter writing as well as extraction and selection of data, file handling with standard or nonstandard data bases, computations and calculation of totals and footing values, a spokesman said.

Also included in the package are subroutines to calculate such things as square roots, declining balance depreciation, standard deviation for group items and summation of digits depreciation, she added.

With the introduction of DYL-Audit, users now have a broader range of audit support packages, which for years has included EDP-Auditor from Cullinane Corp., The Audit Analyzer from Program Products, Inc. and Mark IV/-Auditor from Informatics, Inc.

Summary of Statistics

As a byproduct of its chief functions, DYL-Audit provides summary lists and sheets of all statistics calculated for a given technique; these include standard deviation, mean, coefficient of variation, actual population and "much more," according to the spokeswoman.

Although DYL-Audit utilizes DYL-260 facilities, it also includes a letter writing subsystem that can produce such items as dunning letters and confirmation notices.

DYL-Audit is presently

Correction

The headline reading "Resolve-IMS' Extended With On-Line Monitoring" [CW, Feb. 26] should have referred to Resolve-MVS, and the cost of the package for multiple CPUs at a single site should have been shown as \$21,600, according to a spokeswoman for Boole & Babbage, Inc.

available to IBM OS shops only; a DOS version is to be released later.

Current DYL-260 users can get the DYL-Audit routines for an annual fee of \$1,332; installations without DYL-260 can acquire both "halves" of the DYL-Audit package for \$2,664/year, the spokeswoman said from 16255 Ventura Blvd., Encino, Calif. 91436.

CICS Runs in 'Jig-Time'

GREAT NECK, N.Y. — Jig-Time, an enhancement developed by Labyrinth Systems, Ltd. for IBM's Customer Information Control System (CICS), "drastically" reduces line transmission time and improves response time at IBM 3270 CRT terminals by 15% to 30%. The package does its work by significantly reducing the number of characters transmitted for each CICS user application, a spokesman explained.

Jig-Time intercepts all 3270 basic mapping output buffers and replaces extraneous characters with unique control characters, then passes the new format to the proper

CICS output module, he said.

The Jig-Time module was designed for use in conjunction with CICS under 3270 basic mapping support in IBM DOS/VS or OS/VS systems. Upon installation — which requires less than 15 minutes, according to the spokesman — the module becomes a part of the CICS nucleus.

The DOS/VS and OS/VS versions of Jig-Time are available for \$2,500 each, plus a fee for each remote terminal that varies with the number of terminals involved, Labyrinth noted from 17 Barstow Road, Great Neck, N.Y. 11021.

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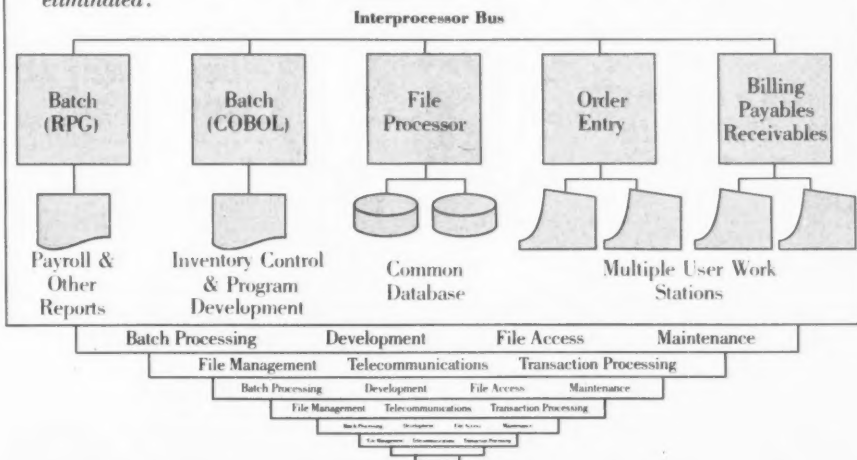
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Software Physics Tunes Medical Claim System

SILLERY, Que. — While national health insurance is still just a concept in the U.S., the province of Quebec has had its Medicare program for eight years. This operation involves many different applications used for each claims processing and has become more effective because of the adoption of a software physics approach based on designs presented by the U.S. Institute for Software Engineering, according to John R. Parent, a consultant working with the Medicare organization.

Approximately 6.2 million people living in Quebec are eligible for complete government-paid health care from doctors. The Regie de l'Assurance-Maladie du Quebec (Quebec Health Insurance Board) —,

commonly known as Medicare, receives health care claims from the entire province.

The board's DP center here collects, processes, validates and then pays out approximately \$750 million dollars in claims each year. The hardware used to perform this operation includes an Amdahl Corp. 470 V/6 with 160 on-line terminals handling 170,000 transactions a day.

Software physics is the basic theory of developing and integrating the technical and managerial engineering practices required to attain standard units for fundamental properties of software work, software power and storage capacity. Derived from existing computer measurements, these vectors are used to explain and adequately predict

system properties and behavior of interest.

The board first became interested in software physics after Parent attended a course on improving chargeback procedures presented by the institute. "We were very impressed with the philosophy and approach the institute took toward chargeback and capacity management overall," Parent explained. "We then send some of our technical people to the software physics course itself. From that, we were able to establish some specific objectives in terms of the chargeback system."

Actual procedures based on software physics relating to chargeback operations were "up and running" in early April 1978. "Using software physics,

we've been better able to characterize the workload and plan ahead in terms of the numbers of hours that are needed to process given volumes of data," Parent pointed out. "Since we installed our program, we've been within 2% of our predictions."

These predictions are made possible by improved procedures for evaluating the performance of existing equipment, planning for new equipment and setting the rates charged to users of the system based on usage and equipment load.

Vectors From Data Base

This year the use of software physics has been directed in the area of costing and chargebacks. "To apply the new approach, we went back through all our old SMF data base from the previous year. We attempted to establish average block sizes and power ratios between our IBM 370/148s and 158s," Parent said. "We then went through the SMF data to get all of the EXCPs by application, lines printed by application, cards by applications and so on."

"From this massive amount of data, we constructed a data base whereby we could go in and do all the necessary calculations to come up with unit vectors for software work, software power and storage capacity," he recalled. "All this work and manipulation of data led to the eventual setting up of tariffs based on the estimated power of our new 470."

Parent has been equally pleased with the extra benefits that have resulted from the use of software physics. "We have also been enlightened as to the consumption of the equipment and have an idea as to whether we are using the equipment efficiently. For example, it lets us know how many tape and disk drives we actually need and what kind of CPU utilization we are really getting," he said.

The software physics approach has helped the board improve its forecasting capability. "We found that the chargeback scheme the institute proposed was extremely equitable in terms

(Continued on Page 42)

OPS Managers

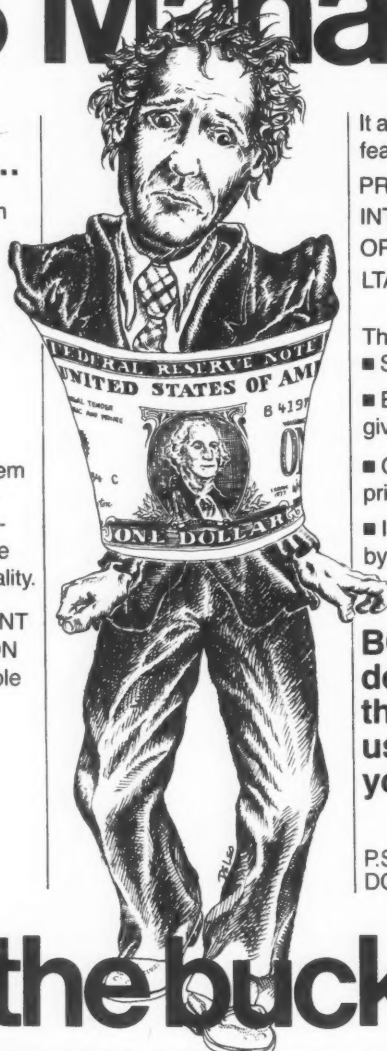
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'Focus,' 'IDMS' Linked

NEW YORK — Information Builders, Inc. (IBI) has interfaced its information control system, Focus, and Cullinane Corp.'s IDMS data base management system so the nonprocedural, English-based report language facilities of Focus are now available to IDMS users.

This means an IDMS user can use simple English statements to screen, sort and format data from files, an IBI spokesman said. Computational and logical facilities are provided for problem solving types of requests.

Other focus facilities available to IDMS users through the interface include graphics, financial modeling and a formal statistical analysis subsystem, he said.

The Focus/IDMS interface obtains data for the report writer through an access module which issues IDMS read-only calls. Focus exploits the record selection strategy of its report language combined with the various ways in which an IDMS data base can be traversed.

Focus was designed to run on IBM 370s in Time Sharing Option (TSO) mode under OS/VS and in Conversational Monitor System (CMS) mode under IBM's Virtual Machine Facility (VM/370). It can be acquired at prices starting from \$39,000.

The IDMS/Interface adds \$8,000 to the cost. Monthly licenses are also available, IBI said from 254 W. 31st St., New York, N.Y. 10001.

Lessors Extend DOS Aid To Include DOS/VS Sites

WASHINGTON, D.C. — Technical support for DOS/360, sponsored by the Computer Lessors Association, Inc. since 1973, has been extended to include support for IBM's DOS/VS Release 34, according to an association spokesman.

As in the past, the support — provided by The Computer Software Co. under contract to the association — is intended for those installations working with systems leased from association members. That covers a lot of equipment; the lessors organization has 20 member firms and they own more than 4,000 systems, the spokesman noted.

Whether concerned about DOS or

DOS/VS, eligible users are offered a telephone hotline service, technical newsletters and assistance in DOS-to-DOS/VS conversions.

The Computer Lessors Association took over maintenance of DOS Release 26.2 when IBM discontinued its support in March 1973. Since then, the spokesman said, more than 6,000 calls have been answered on the hotline, 1,500 tapes with fixes and enhancements have been distributed and 36,000 technical newsletters have been sent out to IBM 360 lessees.

The DOS Support Center is in Richmond, Va. The association is headquartered at 1212 Potomac St. N.W., Washington, D.C. 20007.



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'Symbols' Backs Datapoint Users

SAN ANTONIO, Texas — Datapoint Corp. users of Datashare can reduce source code maintenance time from weeks to days if they use Symbols, a multiprogram cross-reference generator released by Resource Logic, Inc., a spokeswoman claimed recently.

The utility package isolates the use of labels, verbs, expressions, literals and file declarations and can summarize usages among 16 programs at a time, she said.

This capability can be useful in several ways. It enables programmers to identify all locations that would be affected if a proposed change — in data file content or in program logic — is actually instituted, she noted.

It also simplifies more fundamental software upgrades — from one processor or interpreter to another, for instance, permits code optimization and reduces the cost of adding program features, the spokeswoman explained.

Symbols is available now for \$1,500. Resource Logic is at Suite 1222, 8916 Datapoint, San Antonio, Texas 78229.

Software Physics Aids Claims Job

(Continued from Page 40)

of utilization of the various pieces of equipment," Parent stated. "We arrived at the new rates by manipulating the information in the data base by application."

"We have a complete historical data base of everything that has been done so far. By manipulating that data and developing projections, we can establish trends and can accurately estimate the application workload for the coming year."

One factor which has influenced these results is the use of terms and measures that can be understood and used by many different people involved with the DP operation.

"When we first started, we sat down with the user community and explained the software physics approach," Parent said. "We have also published a handbook for user management on the software physics approach. With this it can get a better feeling for what is exactly involved and why we have gone this route. As a result, we've gotten better feedback."

The Oslo-Miami Connection

RCS Facilities Smooth Cruise Line Operations

MIAMI — Business is booming for Norwegian Caribbean Lines (NCL), a cruise line based here although its corporate headquarters is in Oslo. As many businesses have discovered, however, expansion is not without its problems.

According to Kristine Hammatt, NCL's vice-president of finance and administration, "When we introduced a fourth ship into our fleet last year, it was vital that we immediately act to establish a financial system to keep pace with the added workload."

NCL's elegantly fitted cruise ships sail five different itineraries in the Caribbean and a total of more than 200 cruises per year. Each ship holds about 700 passengers in four separate classifications and 300 crew members.

Since NCL's DP department — based on an NCR Corp. Century 151 — was filled to the brim with reservations, general ledgers, accounting and other management information, Hammatt believed it should not be burdened with a host of other projects. This meant a full service supplier was needed.

An evaluation of the remote computing services led NCL to General Electric Co.'s (GE) Mark III service. This not only provided the capability of linking Miami and Oslo, if that seemed appropriate, but included the Financial Analysis Language (FAL II), with which the cruise line built a system to develop budgeting, analysis and forecasting models and eventually, a cash flow system.

Key Indicator Report

A pier count, passenger data and revenue for ships at sea are obtained from both the in-house system and the group reservations staff. They are fed into the Mark III service every Tuesday morning. Data includes the number and the type of passengers and cruise cost variables.

The system responds the same day with the key indicator report, listing actual vs. budget comparisons for each of the four ships for the week and the year to date. This report shows the gross revenue per passenger, the percentage of commission for travel agents and the percentage of subsidy on fly/cruise package vacations.

"The timing of this report is critical," according to Bruce Burner, manager of financial analysis. "Because of the lead time, the next seven or eight cruises are already pretty well in shape."

"From information on these reports, a timely decision may be made that could affect future cruises. The idea here is to try to maximize the net revenue we can derive."

Another important report is the bud-

get, or revenue program that was once a yearly project done manually. "One person used to spend a full month doing nothing but that report and had help doing it. Now we prepare a detailed forecast a minimum of three or four times a year with a lot of simulation, and it takes about a day," Burner said.

"We formerly calculated annually also on a manual basis, a desired cost/sales factor for each of the four passenger groups," he noted.

According to Burner, "When we did it manually, there wasn't any way to try the 'what if' simulation. Now we can respond faster to the marketplace. We are achieving higher load factors

because of better planning and forecasting."

A cash flow system that required many preliminary steps is also nearing completion. "We are not there yet," Burner said, but "we've developed a model to determine the relationship between a revenue forecast and the receipt of cash for the revenue."

"The revenue is reported at the time of cruise, but the cash is received at various times before that. It is a varying and shifting pattern; we are trying to isolate it with various methods of forecasting when the payments come in."

Other reports generated on the Mark III service by Burner and his staff spill

over into other areas of the company. One of these other sections is the marketing department, where management must keep a sharp eye on competition and various marketplaces to alert NCL's regional sales people to trends in their areas.

Organization Problem

According to Greg Tighe, NCL's director of marketing research & development, "the large problem was how to organize and quickly use a massive amount of data. There is plenty of data around; there are stacks of it that comes out of our own in-house program."

(Continued on Page 46)

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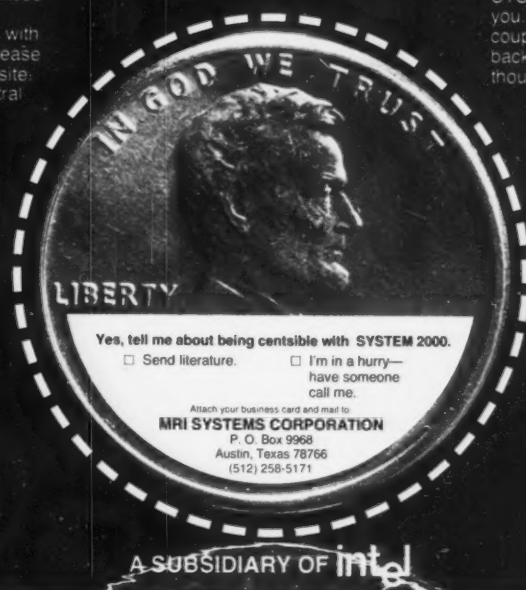
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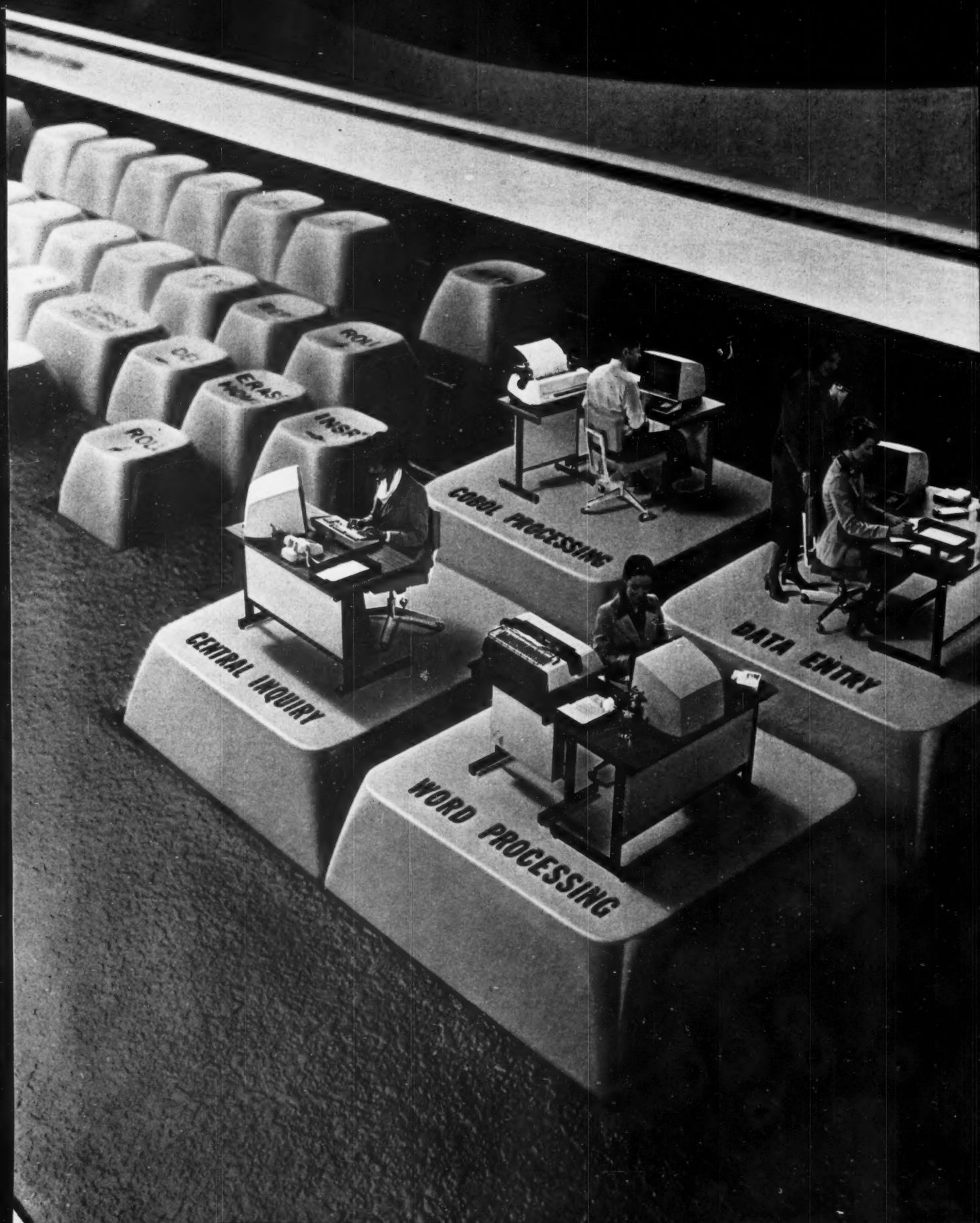
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'Microsim' Uses PDP-11s To Build Micro Programs

MENLO PARK, Calif. — Implemented on Digital Equipment Corp. PDP-11s, Microsim from the Digital Products Group (DPC) is a program development system for microprocessors.

The system includes four facilities. An editor is used to enter and modify source program text; an assembler assembles the program line-by-line as it is entered; a loader loads program segments into memory and computes absolute addresses; and a simulator performs an exact simulation of the target microprocessor, including sophisticated I/O and breakpoint capabilities.

All of Microsim's capabilities are available simultaneously according to a spokesman. If an error is discovered during a program's execution, the error immediately can be corrected, without leaving the simulator.

All editing commands are available within the simulator and can be used to modify the source program text, the

spokesman explained.

As each line of text is entered, it is checked for syntax errors and is then assembled into machine code. When all corrections have been made, a single command is used to reload all program segments into memory and to restart execution of the program, he added.

This contrasts with conventional systems, where it is necessary to invoke the editor, the assembler and the loader in sequence each time an error is to be corrected, the spokesman said.

Versions of Microsim are available to simulate the Intel Corp. 8080 and 8085 and the Zilog Inc. Z80 microprocessors. Versions of Microsim that will simulate other microprocessors are under development.

A perpetual lease costs \$5,900 for the 8080 and 8085 versions and \$6,900 for the Z80 version, DPC said from 350 Sharon Park Drive Q23, Menlo Park, Calif. 94025.

Braille Production Backed

WHITE PLAINS, N.Y. — The Braille Utilities program now available from IBM permits braille embossing when special attachments are added to impact printers operating under IBM 370 control.

The program provides a one-to-one correspondence between print characters and braille characters. A unique feature of this package is its ability to convert many IBM publications, available on print tapes, to braille, a spokeswoman noted.

IBM provides two methods for embossing braille on its impact printers:

RCS Works Well For Cruise Line

(Continued from Page 43)

"But how do you quickly organize and provide management with a decision-making tool? With FAL II, we now get reports that say here is what happened, here's what's going to happen and here are the things we can do to help change the future."

"I rely on time-sharing for all the financial pricing impacts," Tighe noted. "I can go through a seasonal market pricing problem, make major changes in my costs and pricing to the consumer and get my bottom-line answer in seconds, where before it took days."

The company chose FAL II for all its applications. "We eventually intend to get into the Fortran area or Data Base Management System [DMS] II, so we can continue to seek out other applications," he said.

"We looked for specific elements in vendors," Burner stated. "We wanted good response time, flexibility, a good system and a language with which we could work... we wanted to be able to do our own programming. In addition, we wanted superior technical support. Some of the other factors we liked were GE's interface capabilities and its worldwide network. For future expansion, we needed a firm with access to Oslo, as well as to other worldwide locations because cruising is a worldwide industry."

braille brackets and a braille feature. The brackets are designed for braille production in purely programming environments, she said.

The braille feature was primarily designed to produce text, the spokeswoman continued. The braille produced is of high quality and may be used by the general braille-reading public, she claimed.

DOS/VS or OS/VS

The program runs under either DOS/VS or OS/VS; the OS/VS modules can be used under VM/370. It requires approximately 25K bytes of main storage under OS/VS or about 15K bytes under DOS/VS, the spokeswoman estimated.

Although the braille brackets are available free from IBM, there is a charge for the cartridge needed to adapt a standard printer to the braille feature. A user with a 1403 printer can get a cartridge for \$3,325 plus \$195 for installation; a user with a 3203 (model 1 or 2 only) can get a cartridge for \$10,005, with no installation charge.

The monthly license fee of \$130 for the Field Developed Program is waived after 12 consecutive billings, the spokeswoman noted.

Book Sets Stage For DBMS Use

PRINCETON, N.J. — A guide to planning and initiating a data base project, *Pre-Data Base Survey* by Leo J. Cohen, shows how an organization can make a fresh start in data management techniques if data base concepts are used effectively.

Published by Performance Development Corp. (PDC), the book should be useful to corporations inexperienced in data base management systems (DBMS) and to those whose previous experience with DBMS has failed to meet expectations, Cohen said.

It costs \$13.95 (\$12.95 prepaid) from PDC, Building P, 1101 State Road, Princeton, N.J. 08540.

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Fairchild Manager Says: Multinational Nets Top Moving Execs

By Ronald A. Frank
CW Staff

DALLAS — Although international communications facilities appear expensive, they are usually much cheaper than moving people from place to place to accomplish the same business goals, according to William Brasuell, manager of worldwide telecommunications at Fairchild Camera and Instrument Corp.

Speaking at a session on the economics of telecommunications at the recent Intelcom 79 conference here, sponsored by Horizon House, publisher of *Telecommunications*, Brasuell said it is important for users first to have an accurate picture of the total traffic within a company.

This is often difficult, he acknowledged, because functions such as voice and data are

separated, and the people in charge of each system don't talk to each other.

At Fairchild the key to successful multinational network operations has been to put multiple applications on individual overseas circuits to make them cost-effective. A case

CW at Intelcom 79

in point is the order entry inventory control operation, which takes place daily on a worldwide basis.

Many of the orders are from Europe, and they concern products that are being manufactured and shipped directly from the Far

East. This traffic is hubbed through IBM 370/158 and 370/168 mainframes in Mountain View, Calif., at Fairchild's headquarters.

By taking advantage of the office hour overlap between the U.S. and other continents, the circuits for this application are in operation literally 24 hours a day, Brasuell stated.

The orders are input in Europe on Computer Automation, Inc. Syfa system CRTs. They are batched to the DP center in California in Hasp mode by means of alternate voice/data (AVD) circuits.

Voice traffic is sent between the U.S. and Europe during the early morning hours and between the U.S., Hong Kong and Singapore in the afternoon, when the office hours overlap. People often get in the habit of coming in early or staying somewhat later at their jobs to take advantage of the hours when the geographic areas overlap, he said.

When voice cannot be used, the data traffic is transmitted via lines, using them to best efficiency.

Determine Cost-Effectiveness

The first step to determine whether a link will be cost-effective is to get prices, Brasuell said. This is not always easy since international currency rates fluctuate.

In addition, prices for each half of the line must be established since several carriers are involved in providing overseas circuits.

In some cases, even the direction of a call is important, he noted. Voice traffic from the U.S. to Germany costs \$1.70/min on a dial-up (Continued on Page 48)

User Advised to Judge Options In Face of Data Flow Rules

By Ronald A. Frank
CW Staff

DALLAS — As restrictions against the free flow of data escalate in various countries, users of multinational networks will have to evaluate their alternatives, according to David Hebditch, an international consultant.

Speaking at a seminar which dealt with strategic responses to data flow regulations, Hebditch said that users must carefully think about the nature of their data and its importance to their corporations. It is important to see how the data moves around the company's net, he said.

The seminar was held at Intelcom 79, the recent conference sponsored here by Horizon House, publisher of *Telecommunications*.

Users should consider whether there are other ways to handle the same information and, if so, what the alternative costs will be, Hebditch advised.

As a general rule, the less data moved across national boundaries, the cheaper it is to process. But this is primarily because in almost all countries, there is a premium tariff rate for international lines compared with domestic lines, Hebditch explained.

International tariff rates are increasing at the rate of 1% per month, he noted. There is

little indication that this trend will reverse until the various national telecommunications authorities manage to convert their common carrier facilities from analog to digital. This will allow them to obtain better economies.

But because of the overbuild, the average country will need many years to achieve this goal, Hebditch added.

The elimination of international nets is not (Continued on Page 48)

Interactive Workstation Bows

MIAMI — A microprocessor-based interactive terminal workstation unveiled by Rascal-Milgo, Inc. incorporates a dual-buffered addressing system and communicates with IBM devices over dedicated or dial-up lines, according to the vendor.

Consisting of a CRT, keyboard and logic module, the Model 400/3 permits data entry and retrieval while printout is in progress. It includes diagnostic features that allow operators to detect both hardware- and software-related problems without interrupting the workflow, a spokesman noted.

Using IBM binary synchronous 3275/3271 emulation, the terminal can communicate at speeds up to 9,600 bit/sec over dedicated

transmission lines and 4,800 bit/sec over dial-up configurations, he added.

The terminal offers extended editing, highlighting and horizontal and vertical cursor controls. It is equipped with either the firm's 160 char./sec TP-404 printer or the 200 line/min TP-403 printer.

Both the free-standing CRT and the keyboard can be positioned to accommodate individual operators, the spokesman said.

The workstation with a CRT and TP-404 printer costs \$9,200 or \$183/mo on a three-year lease. With the TP-403 printer it costs \$10,410 or \$206/mo over three years, the spokesman said from 8600 N.W. 41st St., Miami, Fla. 33166.

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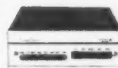


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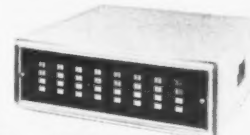
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Communications Called Alternate to Moves

(Continued from Page 47)

up basis, but the same traffic in the opposite direction costs \$5.40/min, he pointed out. The key is to originate the traffic at the lowest cost point.

Rate differences also affect private-line facilities such as those used for AVD traffic. In Korea, additional charges are levied for multiple AVD use.

There appears to be a worldwide trend on the part of the government telecommunications authorities to move from a flat rate to some form of usage-sensitive pricing on private lines, he said.

Despite the hazards, multinational nets can result in big benefits to companies if correctly used, Brasuell said. Conventional mail is subject to time delays and is no longer acceptable for business use.

It is not cost-effective to put a person

on an airplane whenever there is a problem. This eats up executive time, Brasuell noted.

By modernizing its order entry system with worldwide communications facilities, Fairchild has increased sales by \$100,000/year while cutting inventory value by \$30,000. These savings make the cost of a properly implemented overseas circuit not expensive at all, he said.

Low-Speed Data

In addition to running voice and data traffic on the same lines, it is also possible to use low-speed teletypewriter traffic on many of these circuits as a third option. The economics of low-speed data are very attractive, Brasuell indicated.

Teletype traffic via international private lines costs about 26 cents per 100 words. This compares with \$4.40 per

100 words for international TWX service, he noted.

This type of traffic is also cost-effective on a domestic U.S. basis with teletypewriter traffic over Wats lines costing about 2 cents per 100 words compared with 40 cents per 100 words with domestic TWX service. To get the most cost-effective use out of a company's facilities, this kind of analysis is needed, Brasuell advised.

Although Fairchild has achieved good results with international facilities, events must be constantly watched for changes that may impact the operation. Transborder data restrictions pose a potential problem to U.S. multinational companies, Brasuell noted.

Austria has ruled that its privacy protection laws apply to corporations as well as to individuals. Brazil will not supply circuits to move DP data outside the country if it can do the DP work within its own borders.

Prices are always fluctuating with rate proposals, he reminded session attendees. The public packet network soon to be established by the Nordic countries would charge four times more for data transmitted at 9,600 bit/sec than for data transmitted at 2,400 bit/sec.

This seems to be part of the effort to set rates according to the volume of usage instead of applying flat rate monthly charges, Brasuell said.

Digitech Adds Six Features To Enhance Pacer Monitor

RIDGEFIELD, Conn. — Digitech Data Industries, Inc. has developed six features to enhance the capabilities of its Pacer-103 data communications monitor and protocol analyzer.

Specific customer application programs with up to 7K bytes stored in programmable read-only memory can now be added. The firm will assist customers in configuring special programs for this purpose.

A T-Box for the Pacer comes equipped with three added functions. The first switches COD high to allow the Pacer to accept and receive data when external equipment does not turn on COD.

A DTR slide switch allows the operator to force DTR high to the customer's equipment to provide a continuous "on" signal and maintains a dialed-up connection. A break key provides a line break function by applying a steady space to the line.

Pacer programs can now be transferred to tape for external storage. Recorded data in the solid-state buffer can be output for hard copy in a serial

asynchronous stream, at any speed and selected parity with code translation to Ascii, Digitech said.

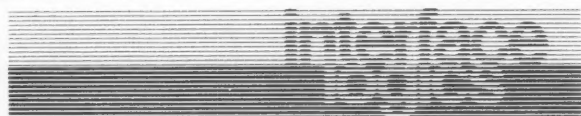
Hex pairs separated by spaces on the serial output are optional.

A dump feature now permits the output of data to a recording device in the native code for later retrieval and analysis, the firm said.

The check character computation has been enhanced with a feature which allows LRC selections with and without parity correction to be made. In addition, reverse Hex is now provided in the Hex display format when BCD, IBM Selectric or Ipar codes are run to conform with byte storage Hex values in IBM 360 and 370 environments.

The Pacer uses hardware and software to provide data diagnostics in a portable unit. The enhancements are now standard on the device, the company said.

The Pacer, with all of the features, is priced at \$8,500. Digitech Industries is at 66 Grove St., Ridgefield, Conn. 06877.



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OUR TERMINALS HAVE IT ALL TOGETHER

Multinational Net Users Advised to Look at Options

(Continued from Page 47)

a viable solution for many multinational firms; they will have to formulate ways to continue to operate in the changing environment. One way to ensure that a company can react is to structure flexible international nets that can be modified to meet changing political and cost considerations, Hebditch said.

Although there is no single foolproof method, users should avoid getting locked into rigid architectures, he advised. Vendor network architectures offer fewer alternatives than structures that support multiple protocols. They can be altered to interface with varying available public services.

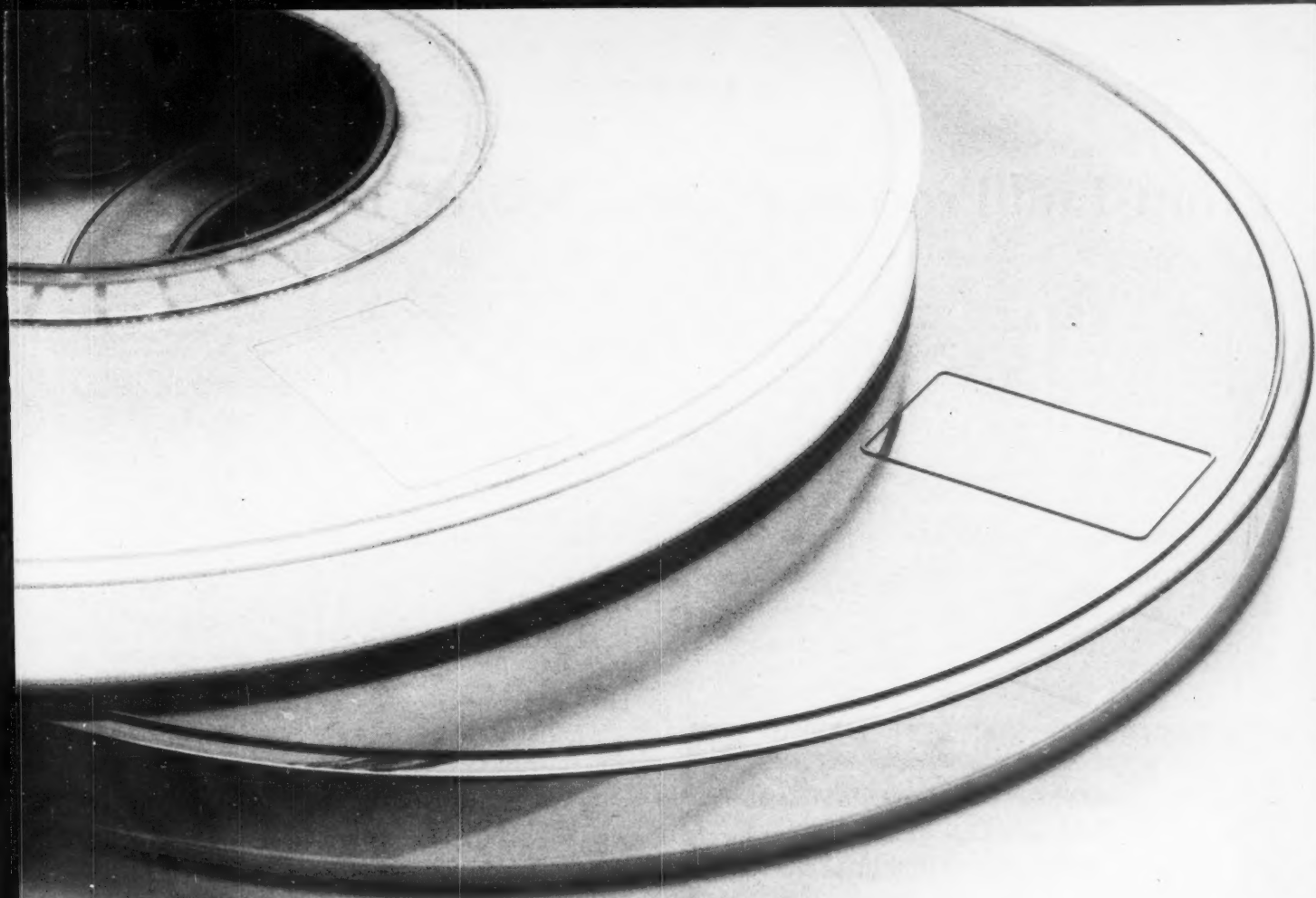
Some foreign countries allow data encryption and even suggest this as one way for users to "protect" the integrity of their data, he noted. In such cases, the privacy protection commissions may require that the key to decrypting the information be provided to government officials.

Obviously, such disclosure would eliminate any efforts to protect the data's contents, Hebditch said.

The encryption requirements often put government agencies into mutual conflict. This is mainly because the telecommunications authorities or postal, telephone and telegraph (PTT) authorities have until now refused to encourage the use of coded data. In fact, most PTTs frown on such operations.

The best advice in the short run for users operating international nets is to keep close watch on changes in regulations that can affect transborder operations. Users should maintain contacts at government agencies in countries where they operate, keep in touch with various trade organizations that monitor this area and make the U.S. government aware of their concerns, according to G. Russell Pipe, another speaker at the session.

Pipe is president of the Transnational Data Reporting Service.



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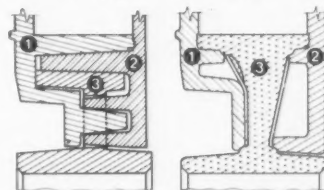
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Helps Firm Maintain Customer Sites Front-End Processor Gives 360/65 Longer Life

Special to CW
VAN NUYS, Calif. — With 10G bytes of on-line storage, two IBM 360/65s with 1M byte of memory each and the need to keep up with 160 on-line customer sites, a real estate service firm here wanted to expand. But it didn't want to upgrade to a system eight times the cost of its current one.

At HW Systems, the answer was to add a front-end communications processor with the ability to handle more lines while keeping the CPU costs stable. The company installed a Computer Communications, Inc. CC-8 communications processor that emulates the IBM 3705 and is compatible with IBM CPUs.

According to Chuck Dedo, HW Systems' vice-president of DP, "We selected the CC-8 because it easily allows us to switch lines between our two 65s and enables us to be more responsive to our client base. This gives us a more

efficient operating system and extends the life of our 360/65s another few years."

Title Searches

HW Systems provides the California real estate and title industry with an on-line informational service that indexes and references all real property transactions. With on-line access to the system, 160 customer sites are engaged in title searches.

HW Systems currently handles 11 of California's most populous counties, which include more than 92% of the population.

Title companies need to know the status of the real property before a policy of title insurance can be issued. A title search is performed to determine who owns the property and whether it is encumbered. HW Systems provides them with this information.

Since installing the CC-8 processor,

HW Systems has been able to redistribute its processing loads. According to Dedo, "One year ago, we were using two 360/65s and a Memorex Corp. 1270 to handle an average of 50,000 transactions for an 11-hour day. These transactions were sent to the system via 20 leased lines.

"Each CPU operated independently; one worked on-line, the other handled batch processing. For timely, cost-effective processing, this information had to be redistributed across the two computers.

"To accomplish this task, it was necessary to switch the on-line load from one CPU to the other," Dedo continued. "With the 1270, this meant physically switching cable lines. This was a costly venture since you run the risk of bending pins and mishandling connections. Moreover, it would take three hours to do."

Allows for Line Switching

The CC-8 allows for line switching, not message or transaction switching, by keying in the program commands on the console/system supervisor. With the CC-8, Dedo said, system switching can now be accomplished within 15 min, and downtime is only a fraction of what it was.

"We have a sizable multidrop system that averages from 10- to 15 drop/line," he explained. "The CC-8 allows us to take a specific line from one CPU and hook it to the other. This loosely coupled system gives us a much higher reliability factor."

With the CC-8, HW Systems now has the ability to construct the network in any configuration and split processing on either or both mainframes. "We increased our reliability," Dedo noted. The firm now gets the most total throughput by using the 65s for both on-line and batch processing.

The CC-8 can handle a sustained synchronous system throughput of more than 200,000 char./sec with peak-load capability approaching 400,000 char./sec. Its statistics collection and display features are tasks not

usually available within a 3705 emulation system.

The title companies rely on HW Systems to provide them with up-to-date information. To begin a real property transaction, the required information is obtained via on-line CRT terminals and printers with speeds ranging from 300 char./sec to high-speed printers.

The system displays real property information that is indexed by the owner's name, the property's address and the legal description; it is also cross-indexed. All liens, transfers and/or encumbrance information can be displayed on the CRT terminals.

Mixture of Terminals

The CCI system can interface with any terminal because it, in effect, emulates the mainframe. Terminals can now be selected for their versatility rather than their IBM compatibility, the user noted.

In addition to handling the 20 telephone lines, the CC-8 can handle any mixture of line types and speeds up to 240 lines. It also includes offloading, CPU polling and error detection.

The CRT console uses color for error detection as part of its system monitor function and for system supervisory functions. In the monitor mode, the CC-8 can control and correct up to 60 error types in one package.

With the increase in real estate activity, the resulting number of transactions places an increased load on HW Systems' information network. The Los Angeles County index alone contains more than 900 million characters of information.

It takes 28 keypunch operators to enter the information that is maintained for the county. For 10 additional California counties, HW Systems uses more than 60 keypunchers.

The on-line system also provides county property tax rolls that are updated upon tax payment.


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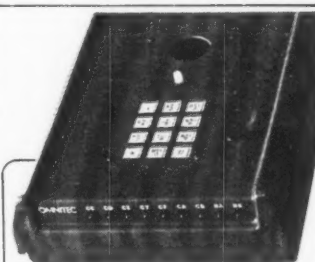
Interface Ties RS-232 Devices, Centronics Units

VIENNA, Va. — Air Land Systems Corp. has introduced the MPC-11, a microprocessor-based interface for Centronics Data Computer Corp.-type printers. The interface provides a serial data link to complex line protocols by linking to any RS-232 compatible device.

The MPC-11 receives and transmits serial data via an RS-232 compatible port. Parallel data is output from the MPC-11 to the device.

While the MPC-11 was designed to plug into and receive its power from Centronics-type printers, stand-alone packaging is available. Firmware packages for most line protocols are also available.

The MPC-11 costs \$1,670 in single quantities and less than \$1,000 in quantities of 100 or more. Air Land Systems is at 2820 Dorr Ave., Fairfax, Va. 22031.



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"We switched to NCR," says Fred Brown of Rogers Enterprises.

BROWN:

Rogers Enterprises is an optical laboratory that fills almost 5000 eyeglass prescriptions a day. We have a complex computer program that guides us through the entire operation. From selection of the lenses out of inventory through the highly technical grinding process to billing of our customer. We have five years of development tied up in that program. And still we switched from another vendor to an NCR system.

NCR'S DUBOSE:

We could offer you the speed you had to have at a lower price than anyone else.

BROWN:

Yes. And NCR has a full line with no gaps. As our volume increases, we can expand our system in reasonable increments. Even better, we can move to a larger system without obsoleting our software. Now with NCR, I will not have to go through another conversion under the pressure of our daily workload.

NCR'S DUBOSE:

That's NCR's Migration Path Engineering. Your software always runs on the next larger system.

BROWN:

VRX (Virtual Resource Executive) really makes our NCR V-8550 go. Our lab program is very large and is used heavily in the morning, but only occasionally in the afternoon. Because we have virtual memory, this



Fred L. Brown (left) is comptroller/administrator of Rogers Enterprises, Inc., of Beaumont, Texas. Ben DuBose is an NCR district manager.

program resides in main memory only when it is advantageous. Otherwise, that program would choke our operation.

NCR'S DUBOSE:

VRX allows you to run up to 35 jobs simultaneously. It dynamically allocates memory and other resources. It controls virtual memory swapping. It constantly monitors for memory thrashing and program loops. And adjusts the job mix to eliminate them automatically.

BROWN:

VRX also provides Online Program Development. Our EDP manager tells me

OLPD has doubled our programmer productivity.

NCR'S DUBOSE:

System dependability has been important, too.

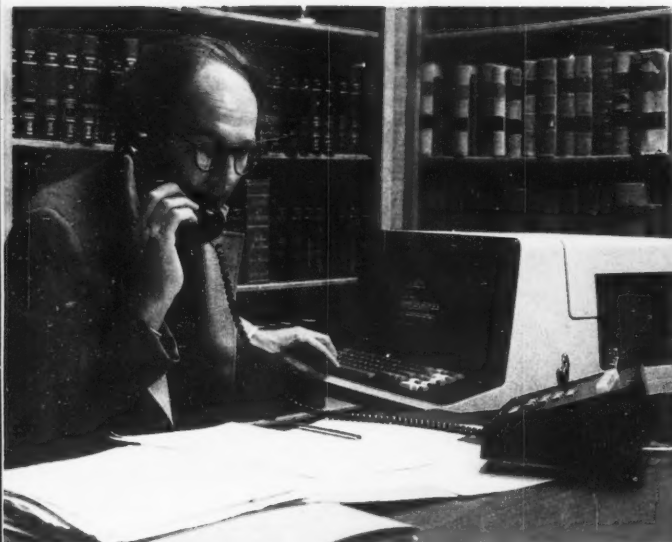
BROWN:

That's right. System operation is critical to our business. Before we switched to NCR, we talked to other NCR 8500 users and found they had all had excellent experience with this hardware. And with NCR service. We were particularly pleased that NCR had a service office right here in Beaumont.

In the NCR office nearest you, there is an NCR account manager like Ben DuBose who knows your industry and knows NCR systems, including VRX. To learn more about what an NCR system can do for you, phone him at your local NCR office. Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.



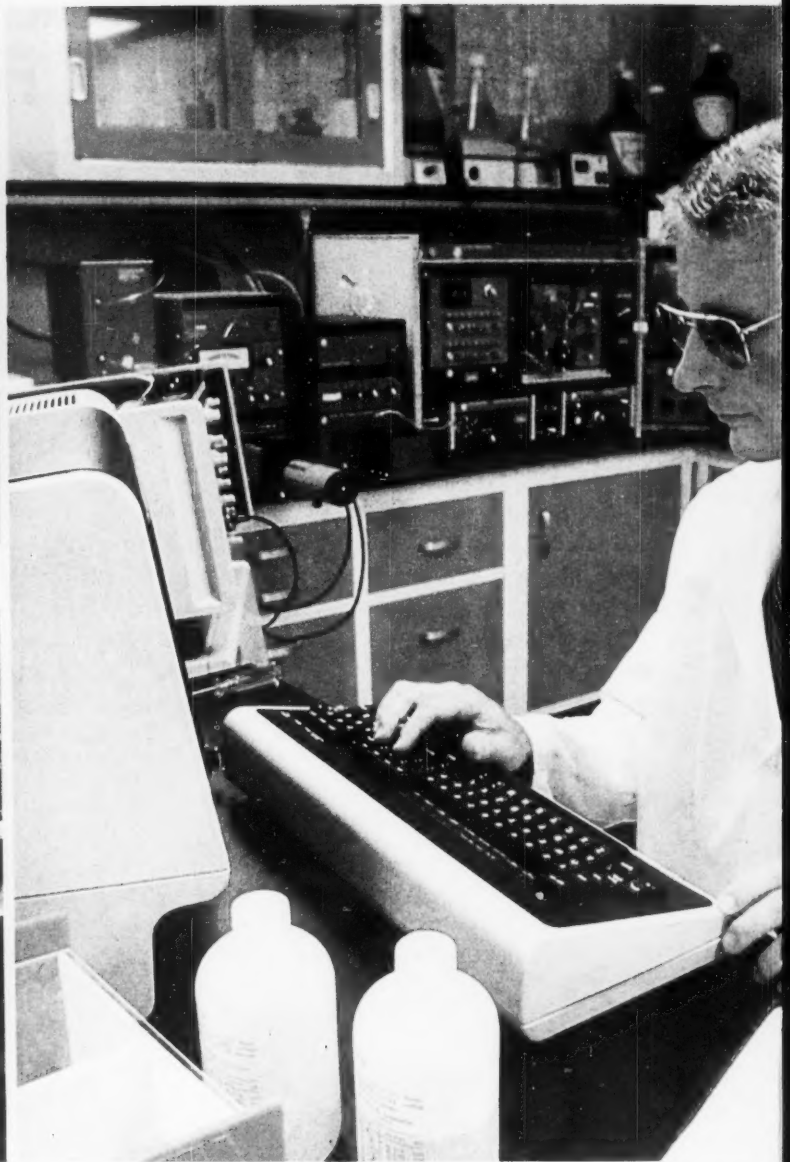
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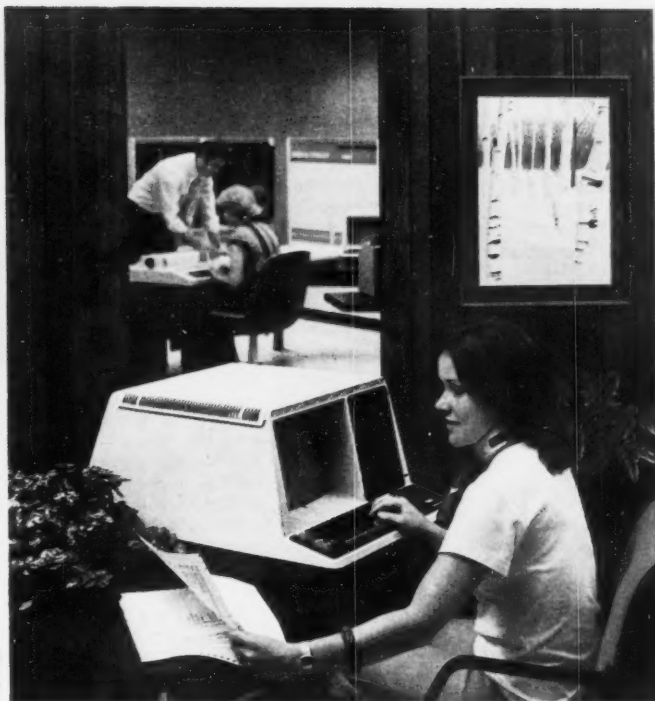
Distributed processing is a reality. The economies of scale have dramatically shifted from centralized, batch-oriented machines to distributed, interactive processing and networks.

Many companies already have hundreds of distributed computers in laboratories, in warehouses, in sales offices, on the production lines. Digital alone has installed more than 140,000 of them.

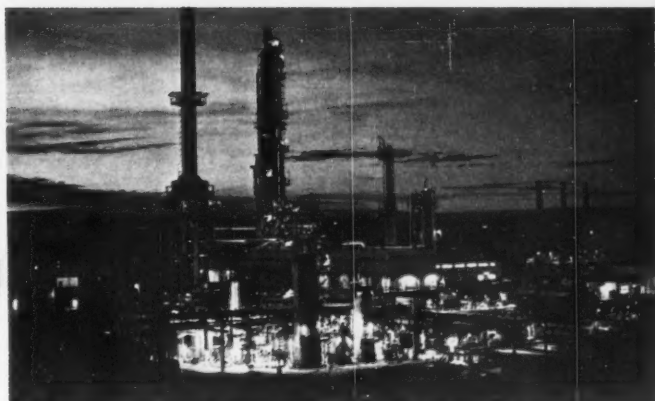
One question remains: how to acquire and exercise control of data.

For is it reasonable to permit such autonomy that data remains unshared? Is it reasonable to permit such independence that all information is isolated, and then duplicated elsewhere, again and again?

Control is important, and DECnet is the best way to gain control and exercise it. DECnet is Digital's networking software. It permits communication among all Digital computer families using virtually any Digital operating system. And through Digital's family of protocol



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to production control systems...



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emulators, you can tie non-Digital computers—including large mainframes—into your network. That network may be configured in a range of topologies—hierarchical, ring, star—matching controls to your management or organizational style and needs.

If you'd like to learn more so you can develop a strategy for controlling your distributed computers as you see fit, fill out the coupon. Talk to the company that started the trend to distributed processing—Digital Equipment Corporation, 146 Main Street, Maynard, Massachusetts 01754. Attention: Customer Services (NR-2/2).

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Operate at 180 Char./Sec DG Printers Incorporate 1,000-Word Buffers

WESTBORO, Mass. — Targeted for time-sharing and general-purpose I/O applications, Data General Corp.'s recently introduced series of logic-seeking, bidirectional printer terminals can print at 180 char./sec and incorporate a 1,000-word random-access memory (RAM) buffer.

The Dasher TP2 terminals use a 16-bit DG Micronova microprocessor to control variable character formats, tabbing and other printing functions. They are available in receive-only (RO) and keyboard send/receive (KSR) configurations, a spokesman noted.

The units can operate at 1,200 bit/sec without data loss and are compatible

with computers and modems using EIA or current-loop interfaces, he added.

In addition, the TP2 terminals can handle half- and full-duplex transmission lines at selectable communication speeds up to 4,800 bit/sec. They can be adapted for parity selection and adaptation functions, the spokesman said.

All terminal models in the DG series print full 132-column lines on forms from 4- to 15-in. wide and use a full 96-character upper and lower case Ascii character set. The units also feature a switch-selectable 6- or 8 line/in. mode that can be employed by the user to cut down on paper waste and save up to 33% in paper costs, the spokesman claimed.

The TP2's nine-wire matrix print

head allows the creation of true lower case descenders, punctuation marks and underscoring, while an alternate character set is optionally available for users who require more than one DG character set, the spokesman continued.

Character sets can be selected by switch or software command, and international fonts with appropriately styled keyboards are offered for foreign users.

In addition, a top-of-form mode included with the terminals allows selection of forms lengths up to 99 lines in one-line increments. A switch-selectable view mode moves the print head during print lapses, giving an unobstructed view of printed text.

The printer terminal can perform plotting and down-line loading, allow-

ing users to design their own character sets or special symbols for foreign language, scientific or graphics applications. The terminals can also incorporate horizontal and vertical tabbing to aid format and text layouts, the spokesman stated.

The Dashers are interface-compatible with all DG computer systems and are character-compatible with TP1 30- and 60 char./sec terminals, teletype-writers and other Ascii input devices, the spokesman noted.

The TP2 Model 6075 RO and Model 6076 RO with condensed printing capabilities are priced at \$3,550 and \$3,770, respectively, while the Model 6077 KSR costs \$3,750. The Model 6078 KSR with condensed printing is priced at \$3,900. DG is at Rte. 9, Westboro, Mass. 01581.



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Multiply your data communication capabilities with the Data-Kinetic System. TELEX, TWX, DDD and Private-wire communications are combined with word processing in one work station. Text editing is accomplished on the CRT display prior to message transmission. This eliminates the need for paper tape, thereby saving time and money. The Data-Kinetic terminal is offered as a turn-key system in various configurations.

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Clifton, N.J. 07012 **UTECH**

IDS Cables Link Test Hardware, CPU

LINCOLN, R.I. — International Data Sciences, Inc. (IDS) has introduced a series of communications test and measurement interfacing cables.

The Model 8520 data cables meet Electronic Industry Association (EIA)

RS-232C specifications and were designed to facilitate the attachment of test hardware to a CPU, a spokesman stated. The 25-conductor cables, supplied with EIA connectors and pin assignments, are available in special

lengths, connector polarities and configurations.

The cables are priced at 50 cent/ft plus \$15 for a pair of end connectors.

Structured to test the integrity of the EIA 25-conductor cables, the Model 8580 portable cable tester indicates openings, shorts and miswired conductors in connectorized cables up to 50 ft, the spokesman continued. Cables are tested by coupling both ends to rear panel connectors on the testing unit and rotating a front-panel switch while pressing a button.

Four rear-panel connectors allow the 8580 to test cables with either male or female connectors at both ends, the spokesman added.

The cable tester indicates faulty conductors in a cable length by flashing a series of red LEDs on the front panel and sounding an alarm. A green light signifies a good cable.

The 8580 cable tester costs \$395, IDS said from 7 Wellington Road, Lincoln, R.I. 02865.

Acoustic Coupler Works In Answer, Originate Modes

SAN JOSE, Calif. — A Bell-compatible acoustic coupler introduced by Digicom Data Products, Inc. can be switched between answer and originate modes and incorporates an additional filter stage that is said to enhance operation over poor quality telephone lines.

The AC-312 handles data rates of up to 300 bit/sec and can accommodate 1,200 bit/sec speeds with the addition of a plugable printed circuit board, a spokesman stated.

The unit has an eight-way diagnostic indicator window indicating power, transmission and reception information and a programmable reverse channel.

The coupler operates in half/full- or

half-duplex, depending on the transmission board used, and uses Western Electric Series 500 handsets or the equivalent, the spokesman said.

The AC-312 answer and originate model costs \$295, while the originate-only coupler is priced at \$245. The AC-312 answer model and the 1,200 bit/sec unit sell for \$245 and \$495, respectively. Printed circuit board upgrades cost \$370 each.

Digicom is located at Suite 108, 1440 Koll Circle, San Jose, Calif. 95112.

Gandalf Mounts Data Set on Rack

WHEELING, Ill. — Gandalf Data Inc. has introduced the RM 3309 rack-mounted synchronous data set, which is the equivalent of Gandalf's LDS 309 stand-alone synchronous data set.

The RM 3309 was designed for operation over four-wire dedicated circuits and conforms to common carrier requirements at 1,800-, 2,400-, 3,600-, 4,800-, 7,200-, 9,600-, 14.4K and 19.2K bit/sec. Its range at 9,600 bit/sec is eight miles.

The RM 3309 plugs into Gandalf's 3000 cabinet, which holds up to 14 RM 3309s when a single power supply is used.

The RM 3309 costs \$560 for a model capable of speeds up to 9,600 bit/sec; a model for speeds up to 19.2K bit/sec costs \$610. Gandalf is at 1018 S. Noel, Wheeling, Ill. 60090.

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Interface Option by Vydec Links Text Editors and CPU

FLORHAM PARK, N.J. — An interface option for the Vydec, Inc. models 1200 and 1400 text editors allows users to access a CPU, communicate data in batch mode to that CPU or other editing system or have their text editor emulate a conversational terminal.

The 2741 Plus interface option was designed for use with Vydec editors equipped with programmed options kits and the appropriate diskettes. The unit operates at user-selectable line speeds of 134.5-, 150-, 300-, 600- and 1,200 bit/sec over switched or leased lines in correspondence or Vydec-modified Ascii code, a spokesman said.

The interface requires IBM 2741 communications protocol and can be used for data retrieval, batch transfer and data dissemination duties.

Interface users can use their editors

Word Processors Linked Together With Translator

CHICAGO — Word processing systems from IBM, Digital Equipment Corp. and other vendors can reportedly communicate with each other over dial-up telecommunications networks or private, hard-wired lines using a protocol translator introduced by Telesystems Network, Inc. (TNI).

The TNI 303 protocol translator offers users a dial-selectable menu of system protocols residing in programmable read-only memory (Prom) inserts that convert foreign communications protocols to signals understandable by the host system, a spokesman said. Conversion is bidirectional and the translator can handle up to 10 different systems.

Communication speeds are selectable from 300- to 9,600 bit/sec, depending on the system or on the operator's wishes, the spokesman said.

Users operate the translator by dialing the name of the system to be accessed with a FROM switch and then indicating the receiving system by adjusting the TO dial.

Although the translator is presently suitable only for word processing systems, the TNI spokesman stated future plans include adapting it for use with Hewlett-Packard Co. minicomputers by the end of this year.

The protocol translator is priced at \$7,950 including three translator inserts and slight customer customization. Additional Prom translator cards cost \$350 each, the spokesman said from TNI, 410 N. Michigan Ave., Chicago, Ill. 60611.

to verify the status of text sent or received; revise either data received or to be transferred to the CPU; tailor communications to a specific computer environment; and perform off-line editing and storage functions — relieving the host CPU of text-processing requirements, the spokesman added.

After the initial setup and floppy disk installation, the system controls the whole text-editing procedure, continuously informing the user of the status of the operation.

The interface option costs \$700 plus \$1,200 for a microprocessor power kit required for implementation.

Vydec is located at 9 Vreeland Road, Florham Park, N.J. 07932.

Switch Lets Sanders Users Produce Hard Copy

NASHUA, N.H. — Sanders Associates, Inc.'s Model 570 hard-copy CRT terminal can produce high-quality, cursive stroke copies from as many as four Sander's Graphic 7 CRT stations by using a matrix switch introduced by the firm.

The Model 575 receives the standard set of random-scan X, Y and Z signals from each of the Graphic 7 terminals controllers and multiplexes the signals into a single set for input to the 570 hard-copy unit, a spokesman explained.

Because the matrix switch provides complete transparency of operation, each Graphic machine operates as an independent unit, while

the hard-copy unit runs as if connected to a single terminal.

The switch was designed to queue copy requests from each terminal and respond to each request in turn. It allows each terminal to maintain control of the hard-copy unit and generate an uninterrupted sequence of copies, the spokesman continued.

Deliveries of the switch, which is priced at \$4,000, are scheduled for the second quarter of this year. Additional information is available from the marketing manager at Sanders, Daniel Webster Highway South, Nashua, N.H. 03061.

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'Interesting, Higgins, But Not the Bus Architecture We Had in Mind.'

NCR Adds Terminals for Factory Applications

DAYTON, Ohio — Designed for basic attendance, materials tracking and other factory control applications, a series of terminals recently introduced by NCR Corp. for its Data Pathing processors ranges from simple numeric entry devices to fully interactive data collection stations.

The NCR 200 terminal series is based on Data Pathing's internal bus structure and can accommodate bar codes, magnetics, process monitoring, piece counting and numerical control monitoring operations, a spokesman said.

Badge and card reading units incorporate a photo-optical reading process, and all of the terminals contain completely sealed micromotion keypads that reportedly protect the internal electronics of each system from dust

and contamination.

The communications systems use a two-wire data line and may share the same data lines with other Data Pathing devices, the spokesman noted.

User-selectable features for the terminals include an interactive CRT which allows verification of keyboard input and error feedback; a step-by-step user-tutorial display; and application-controlled prompting aids that simplify operator training.

Two types of pressure-sensitive keyboards are also available with each unit, the spokesman continued. The 204 and 205 models contain a numeric-only calculator-type keyboard, and the Model 206 has a full alphanumeric keypad arranged in block layout.

The terminals may be ordered with Hollerith or Data Pathing coded badge readers and 22- and 80-column Hollerith card scanners.

Prices for the 200 series terminals range from \$2,145 to \$5,595, depending on desired options. Monthly

rentals on a five-year lease plan range in cost from \$38 for a basic terminal to \$113 for a fully configured device.

One- and three-year lease packages are also offered, the spokesman said from NCR, S. Patterson Blvd., Dayton, Ohio 45479.

Epic Controller Compatible With Bisynchronous Mode

BOCA RATON, Fla. — Designed to take advantage of the error detection and correction and synchronization capabilities inherent in the binary synchronous protocol, Epic Technology, Inc.'s interface controller can be used

in point-to-point and multi-point applications.

The controller can be configured to achieve full compatibility and data transparency with equipment using the binary synchronous protocol. It can also be used to adapt specialized data machines such as typesetting and photocomposition equipment to word processing or minicomputer and large computer systems, the firm said.

Optional features include an internal asynchronous modem, an auto-answer capability and a buffer storage function.

The controller is priced at \$2,950, with OEM discounts available from Epic Technology at 2730 N.W. First Ave., Boca Raton, Fla. 33432.

EDP professionals have a word for the new Wang VS computer.

"Incredible."



Richard Berger, Vice President and Data Processing Manager, Bughaus, Inc., a Volkswagen service center network headquartered in Hartford, Conn.

"Because we had been using a computer—the Burroughs B1700—with card input sequential files and no video displays, we suffered long delays and storage constraints."

"Now, with our Wang VS system, storage is virtually unlimited, and we simply recall a screen load of information on the CRT to make a change in seconds—all of this without interrupting our normal flow of work."

"We've put everything in our business onto our VS system, including payroll, accounting, sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs."

EDP professionals in more than 100 companies are singing the praises of the Wang VS. And for good reason.

The VS is a remarkably sophisticated, fully expandable virtual storage computer designed to provide maximum interaction in a mainframe environment.

The VS provides for distributed data processing, thus avoiding costly consumption of mainframe resources. It's fast, responsive, easy to use and can support up to 2.3 billion bytes of on-line storage. What's more the VS speaks EDP people's language: COBOL, BASIC, RPG II and ASSEMBLER.

We also think you'll appreciate how simple the VS is to operate. In fact, because of its level of sophistication, it can be operated by people with little or no computer-related training or experience.

One more thing: the entry level price of the VS is under \$50,000. Which is perhaps the most remarkable thing of all about this computer.

For more information on the VS, return this coupon to Wang Laboratories, Lowell, MA 01851.

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational on-site on February 15, with 61 programs written, debugged and tested—all by only two people—and not a single line of code had been written until the machine came in the door."

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance, language-availability, user-utility software."

"I think the real key for the DP manager is the utilities available with the VS, its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

J.P. Scott, Data Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pa.

"Unbelievable."



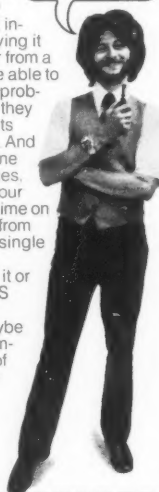
Kenneth W. Cakebread, Manager of Data Processing, Trans-Air Forwarding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system. Not only did I do it: Thanks to the programming power of the VS, I actually came up with more."

"Before we converted to the VS, the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information and keying it into the computer from a workstation, we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities, I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second."

"And believe it or not, while the VS gives us faster access and maybe triple the programming efficiency of our old system, it was only half the cost."

"Amazing."



I'd like to know more about the Wang VS. Please send me a copy of your Executive Brochure.

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Problems of SNA Subject of Forum

WASHINGTON, D.C. — The formats, protocols and problems of IBM's evolving Systems Network Architecture (SNA) will be the topic of a three-day seminar presented here May 16-19 by Technology Transfer, Inc.

The educational sessions will be chaired by Dr. Rudy Cypser, author of *Communications Architecture for Distributed Systems* and program director at IBM's Systems Research Institute. Guest lecturers William Bernstein, James Atkins, William Flanagan and Frank Corr — all leading contributors to SNA — will provide an in-depth profile of the networking systems for users involved in configuring a system that employs SNA.

Seminar discussion topics include the multiple-host networking provided by SNA-3, an approach for connecting non-SNA terminals to an SNA network, an enhanced distributed data processing capabilities.

The registration fee for the seminar is \$595. Further information and registration material is available from Technology Transfer at Box 49765, Los Angeles, Calif. 90049.



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John Singleton, Senior Vice President
Data Processing and Bank Operations
Maryland National Bank

"STC equipment keeps critical data available to us 99.95% of the time in one of the most demanding business computer environments I've ever seen."

Maryland National is one of the most successful banks in the U.S. It processes up to 1.3 million checks and about 550,000 Master Charge transactions every working day. In an environment like this, a computer equipment failure can cause substantial financial and legal problems. John Singleton, who oversees the bank's operations and data processing divisions says, "We now store all of our data on Storage Technology Corporation tape and disk drives, because they give me the best performance I've ever had in 18 years of data processing."

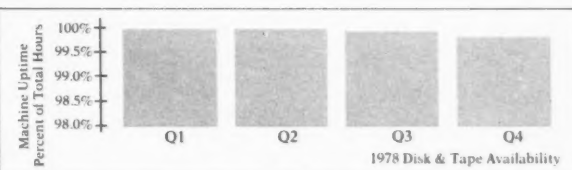
STC is committed to cutting the costs of information storage.

Maryland National's online application and data base system consists of two large-scale computers, servicing a statewide network of 146 branches. The system also communicates with other computers across the country for Master Charge transactions, and with computers worldwide for international funds transfers.

"Another reason I chose STC," Mr. Singleton says, "is because what I found there were sound, innovative people who don't want to see technology held back. They were able to provide me with the advanced products I need to keep my information storage costs to the minimum, and to keep up with increasing user demands."

STC's reinvestment of 6% to 8% of annual revenues in R&D is a good measure of commitment to serving customers. During 1978, this investment paid off with such innovative, cost-cutting products as the world's first solid-state disk, a special storage device that increases the throughput of large-scale computers; the first double-density disk drive that packs twice the information in the same amount of space, for about 30% less cost; a communications device that doubles the capacity of private long-distance phone lines; and the world's first intelligent minicomputer disk.

A modern bank like Maryland National stores its money on computer disk and tape. Not in a vault.



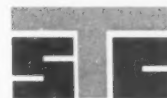
Maryland National Bank operates IBM 370/158 and Amdahl V5 computers to which are attached 16 STC tape drives, 34 STC disk drives, and 8 STC storage controllers. During 1978, STC equipment availability totaled 406,656 machine hours, or an average of 99.95%, the highest reliability of all equipment in the operation.

"Their field service engineers don't just fix things. They anticipate problems, and show us how to avoid them."

STC is committed to keeping customers' equipment available and in service through one of the largest and most sophisticated service organizations in the industry. This 1,100-person Field Engineering team is armed with STC-proprietary diagnostic tools that do more than facilitate repair. They enable a Field Engineer to look ahead, spot potential problems, then work with his customer to schedule preventative maintenance to avoid the problem.

If your company operates a mainframe computer, you should investigate STC's unique partnership approach to doing business, an approach that includes a commitment to you—in writing—for superior equipment performance, reliability, and service. It's this commitment, to John Singleton and all customers, that has made STC the leading independent manufacturer of high-performance data storage equipment.

To learn more, write for the STC Corporate Profile: Storage Technology Corporation, 2270 South 88th Street, Mail Drop 3M, Louisville, Colorado 80027. Or phone (303) 497-5151.



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Our Series 700 Family puts some effective communications skills at your fingertips: powerful editing and preprocessing at the source for cleaner data and less computer load, and quick, direct communications with your computer for faster turnaround time. It sends and receives at night, unattended, saving on phone rates and without additional operator costs. It prints paychecks, sales orders, reports and all your data on our reliable OMNI 800* printers, and has them ready for you in the morning.



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TEXAS INSTRUMENTS.

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Systems Handle Mail Orders Management Inputs Operation Ideas

By Howard A. Karten

CW Staff

CHICAGO — DP operations personnel are often criticized for being wrapped up in their own world, lacking awareness of what the rest of the company is doing. But at Spiegel, Inc., the mail order merchandiser here, the situation is just the reverse: top management is actively involved in DP planning, according to Ken

Bochenski, manager of the firm's management information services.

"Top management — all the way up to the board chairman — takes a very active role in defining what projects we should be undertaking and in what areas we should be working," he explained. "This has made life easier."

"It means we are in the spot-

light, but it also means we have a well-defined direction. It's the price we're willing to pay for total agreement on where we're going, what we're doing and how we're getting there."

The wholly owned subsidiary of Beneficial Finance Corp. runs two IBM 370/165s, each with 3M bytes of storage, under OS/MVT. Attached to these twin systems are approximately 600

IBM 3277 CRTs. This number rises to approximately 850 during the pre-Christmas buying season, the DP manager said.

Six On-Line Systems

Six major on-line systems take up the bulk of Spiegel's DP work: an order entry system, an order feedback billing system, an automated inventory management system, a credit approval system, a customer service system and IBM's Time Sharing Option (TSO) — used for program development by the company's approximately 75 programmers.

"Conceptually, the order entry system drives all the other systems, and they're all interrelated from a normal business standpoint," Bochenski said. When an order comes in, the company has to check the customer's credit, ship the order, bill the customer if necessary, update a file of customer purchase histories and take care of warehouse record-keeping and other activities.

(Continued on Page 66)

DDP System Gives Data Fast Ride To Tire Company's Headquarters

By James M. Venglarik
And Duane F. Lingenfelter

Special to CW

INDIANA, Pa. — In buying a system, it is important not only to consider cost, but also cost justification: Is it worth it?

Our company answered "yes" to this question and recently replaced a \$6,000/year punched tape system with a \$42,000 distributed data processing (DDP) system that is now virtually indispensable.

The McCreary Tire and Rubber Co. is a \$50 million-a-year company which produces specialty tires. It has three outlying warehouses in Charlotte, N.C., Indianapolis, Ind., and Leetsdale, Pa., and a warehouse at headquarters here.

As with any business, our activities generate paperwork. Order processing and inventory tasks are carried out at the warehouse. Credit checking, traffic and freight determination, as well as customer invoicing and crediting are done out of our corporate offices. For the latter functions, we use a Univac 90/30 mainframe.

Before installing our current order entry/inventory system, we prepared orders with punched paper tape and a Flexwriter. Each evening, the prepared paper tape was transmitted by teletypewriter from the warehouses to headquarters.

The warehouses manually updated their inventories to reflect orders. With this system, we reconciled monthly headquarters' inventory data with the same data maintained by the warehouses.

Designed System

However, problems with this system led us to consider more automated solutions. Then, early in 1977, we designed a new system. It was to be an on-line order entry/inventory system with back, hold, shipped and printed orders.

Inventory would be current and available under this system, and each warehouse would have only its inventory and orders available for access. As part of this system, we needed formal allocation, back-order and in-transit systems between warehouses.

Some of our hardware and software requirements were Cobol, a fixed disk (5M bytes per warehouse), medium-speed printers to print multipart forms with excellent print resolution, a magnetic tape unit at headquarters, sufficient main memory to handle the application, a CRT input device and communications capability for unattended use at the

warehouses.

We put out requests for bids to several vendors and eventually chose Sycor, Inc. as a supplier. Two factors led us to this choice. Sycor submitted a bid approximately 60% of that of its nearest competitor, and we spoke with Sycor customers who talked in positive terms about the firm.

(Continued on Page 66)

Operations' Specialist Says:

Data Centers Need Fair Management

By John L. Diesem

Special to CW

NEW YORK — To a large extent, the management of DP facilities has suffered from a lack of rigorous effort and a slipping of the standards that are often applied to other aspects of DP.

The same company that will apply stringent project control standards to a systems development effort often seems to be at a loss to evaluate its own data center. An attitude commonly en-

countered is, "Well, everything seems to get out on time — usually."

It's easier to measure success or failure in a development project than in the computer room. Simply put, one need ask only two questions: Is it running? Is the user satisfied?

Data center operations have been cloaked in mystery. Arthur Andersen & Co. is often told by client executives that they don't understand their data center op-

erations and are unable to form an educated opinion about the efficiency and effectiveness of computer room operations. One client, a chief financial officer, told us he had ordered a second IBM 370/168 solely on the strength of a request by his management information systems director. The officer admitted he had no idea if the system were needed.

Our reaction to this is to stress (Continued on Page 62)

Bits & Pieces

Reinker Recycles Ribbon for \$1

CHATSWORTH, Calif. — A printer ribbon reinker recently introduced by Data Devices International can recycle a ribbon in 5 minutes at a typical cost of approximately \$1, according to the vendor.

Designed for users who normally use 20 or more ribbons per month, the System 1000 can reprocess ribbons at least three times while still maintaining "like new" quality, the company claimed.

An ink metering system in the unit permits reinking 3-, 4- and 5-mil ribbons in a uniform manner, a spokesman added.

The reinker features an alignment assembly that eliminates ribbon edge fraying and an ink recirculation system that reduces clogging in the ink reservoir, he

said.

Ribbons from 14- to 17.5 in. wide and up to 50 yards long can be processed on the device. A 20-yard ribbon can be reprocessed in approximately five minutes, the spokesman said.

The System 1000 costs \$4,995 from the company at 20235 Bahama St., Chatsworth, Calif. 91311.

NBA Cuts Prices On COM Publications

SILVER SPRING, Md. — The National Micrographics Association (NMA) has announced special price reductions on three of its publications as part of its "Building Information Bridges" promotion.

The publications — *Fundamentals of COM*, *Format and Coding for COM* and *COM and Its Applications* — are available for \$7 on a 30-day, free-trial basis. The publications cover the basics of

computer output microfilm (COM) systems, ways to implement a COM program, COM applications and industrywide standards for using COM.

The publications can be ordered from NMA at 8728 Colesville Road, Silver Spring, Md. 20910.

Exide Offers 600 kW UPS

RALEIGH, N.C. — An uninterruptible power supply (UPS) from the Exide Power Conversion Division of ESB, Inc. provides 600 kW (750 kVA) of uninterrupted power for computer systems.

The unit is said to be the largest rated, single UPS module presently in production, taking up approximately 10 cubic meters of space.

The average cost of a 600 kW installation is approximately \$200,000, Exide said from 3301 Spring Forest Road, Raleigh, N.C. 27604.

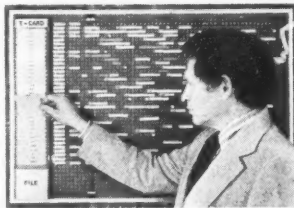
Board Helps Monitor Up to 65 Activities

ST. LOUIS — A scheduling tool recently introduced by Magna Visual, Inc., can help users schedule and monitor up to 65 activities at a time.

The T-Card Index Board kit comes in three sizes for keeping track of up to 35, 50 or 65 activities.

Flexible, cuttable bar magnets are used to represent the amount of time required for each job phase. They can be rearranged on the board as required, a spokesman noted.

A card file mounted on the board holds the "T-cards" that are used to provide detailed information on



T-Card Index Board

each activity.

The TCB-35 costs \$149, the TCB-50 is priced at \$279, and the TCB-65 costs \$325 from Magna Visual at 1200 N. Rock Hill Road, St. Louis, Mo. 63124.

Two Enhancements Ease Megraphic 7000 Graphics

SAN DIEGO — Two recent upgrades for the Megraphic 7000 vector refresh terminal made by Megatek Corp. give the device additional capabilities with no additional burden on the software that drives the unit, according to a spokesman.

The Rastorizer introduced by the company is a plug-in module that enables any Versatec, Inc.-compatible electrostatic printer/plotter to produce hard copy from the Megraphic 7000.

The vector-to-raster converter produces copies in 10 to 15 sec and eliminates the need for sorting the vectors before producing hard copy output, the spokesman said. The unit can operate at the speed of the electrostatic

unit producing the hard copy.

Implementing the sorting operation entirely within the hardware eliminates the software burden that would otherwise be placed on the mainframe, the spokesman explained.

The plug-in module alone costs \$3,000; a Megraphic terminal incorporating the unit costs approximately \$24,000.

Two-Dimensional Rotation

The other upgrade made by the company provides two-dimensional rotation through a hardware clipping, rotation, scaling and translation (HCRST) module. The same module also provides improved translation and scaling abilities, the company noted.

These allow an image to be moved to a new location on a CRT with no changes to the displayed image and permit the size of the image or a selected aspect of it to be increased or decreased.

The HCRST module costs \$6,000; a Megraphic terminal incorporating the module costs about \$30,000, while a Megraphic terminal with all available options costs approximately \$35,000 to \$40,000.

Megatek is located at 3931 Sorrento Valley Blvd., San Diego, Calif. 92121.

Automatic Unit Cleans Tapes

WALTHAM, Mass. — Kybe Corp. has extended the top end of its SLT-80 series of magnetic tape cleaner/testers with the addition of a high-speed, fully automatic cleaner/tester for 1,600- and 6,250 bit/in. tapes.

Said to be the industry's first automatic loading tester, the SLT-83 can process a 2,400-ft reel of tape in 3.75 min., a spokesman claimed. The unit can automatically thread, clean, test, deionize, retension and rewind a tape in one operation, he added.

Since the operator of the unit doesn't touch the tape, possible damage is minimized, Kybe noted.

The device is the only tester available that can differentiate between tolerable dropouts, for which a computer system can compensate, and intolerable dropouts, which will cause aborts or processing errors, the spokesman asserted.

The SLT-83 provides complete status information on the tape being processed, with an inkless chart recorder and four automatically resetting LED counters to log errors.

The unit sells for \$14,950 from the company at 132 Calvary St., Waltham, Mass. 02154.



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Data Centers Seen Deserving Fair Treatment

(Continued from Page 59)

to our clients that the same management standards are applied to all phases of DP that are regularly applied to the other areas of a company. For example, it is common knowledge in the DP industry that as use of the hardware approaches some maximum level, service levels begin to drop off.

If you're running at 95% of utilization, you have a very small reserve on which to fall back. If a rerun is necessary, some service level will suffer.

Anyone in a business that sells services would certainly recognize this principle. If you budget 100% utilization of your product-producing personnel, either you won't be very responsive to new business or you will have to let some existing work suffer

to support the new opportunities.

Management can establish objectives for computer operations that are very similar to those used in other areas of business. Data center performance can be measured, tracked against stated plans and reported to key executives in nontechnical terms. Some typical objectives involve service, cost control, and productivity and resource utilization.

One of the difficulties in defining these management objectives is to relate them directly to data center management. Top management can use several questions to gain further information, such as:

- How should service be defined and measured?
- How should productivity be de-

finied and measured?

- What cost elements should be measured? At what levels should they be?

Data Center Scorecard

As a result of our consulting practice over the years, we have identified several criteria that are important to executives in managing data centers. We often use these criteria as a scorecard in a brief study to determine, at a very general level, where a company may have problems in its data center operations.

The first criterion is that daily activities be known. In a well-managed facility, management is almost always aware of problems before users are. The status of production and testing is

always easily obtained, and special requests and emergencies are quickly evaluated.

Secondly, the environment is controlled; all problems — however slight — are recorded. Action plans for tracking error resolution have been prepared ahead of time and are in use.

The result is that problems rarely recur. When problems do occur, DP management is aware of their magnitude and impact on production and testing.

Furthermore, there are standard procedures for operations and systems development. Training is formalized and required. Project control — if not automated — is provided manually, and personnel and other resources are measured and tracked.

The result is that the track record for systems development is generally good, with systems almost always installed on time and on budget.

Another element in a well-run shop is that DP management has established objectives of budget adherence, people development and equipment use. A short- to-medium-term planning process has been established and is followed, with plans readily available and in clear English.

Other Characteristics

In addition, a good installation is characterized by active involvement of users with data center management. Users are either openly pleased with their level of computer support or are firmly committed to joint efforts with DP management to improve this support.

Users are also well-informed about the status of their DP projects and support the time commitments of their people to these projects.

Moreover, DP management should be able to accurately predict its resource requirements and to commit the facility configurations up to three to five years in advance.

These points are meant to be guidelines and are by no means intended to be exhaustive. To correct a problem might be as simple as installing a good daily log and error resolution process. On the other hand, a major overhaul of every procedure in the DP area could be necessary.

Diesem is a senior manager in the Administrative Services Division of Arthur Andersen & Co. He specializes in the review and analysis of client data center operations.

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The Model 1250 winder costs \$35; the 1270 costs \$70. The reels cost \$1.80 for the Model 4220 and \$2 for the Model 5400. Datacq can be reached through P.O. Box 3200, Monterey, Calif. 93940.

An 'Arpanet in a Box'

Professor Building Net With 10,000 Nodes

By Robert L. Glass

Special to CW

SEATTLE — What would happen if 10,000 microcomputers were linked together in a complex network? You might get a version of Arpanet, the Defense Department's nationwide computer system linking many different kinds of processors.

To create an "Arpanet in a box" is the aim of the distributed processing research now being conducted here by Prof. Larry D. Wittie of the State University of New York (SUNY) at Buffalo. Wittie has linked together 18 Digital Equipment Corp. LSI-11 microcomputers and several Zilog, Inc. Z80 micros occupying a single equipment rack.

His long-term goal is to build a major micro network having 10,000 computer nodes.

Two-Fold Objective

Wittie's objective is two-fold: to explore concurrent, distributed microprocessing power and operating systems and to determine the feasibility of providing "maxi" services with a large micro network.

The problems of building an operating system for a network of this size can be discussed using the terminology of the political sociologist, Wittie said at a recent meeting of the Puget Sound Chapter of the Association for Computing Machinery here.

Wittie's implementation uses an "oligarchy" of two or more control computers, with a hierarchical breakdown of tasks among subsidiary computers analogous to the breakdown of a management organization.

Resource management, including allocation of tasks to micros, becomes a major part of the function of the operating

system with this approach, which Wittie calls "navel watching." Feasibility rather than optimization is the goal of this first implementation, and the system will probably be very inefficient, he acknowledged.

The language used to code the operating system is Concurrent Pascal. Code for the LSI-11s is compiler-generated,

while instructions for the Z80 are hand-compiled from checked-out Pascal code, since no Z80 Concurrent Pascal compiler is yet available.

Version Available Soon

A minimal version of the operating system should be available soon, Wittie indicated. The system will include some hardware modification

of the LSI-11, which he calls his "candidate for a computer on a chip."

The network, which Wittie has dubbed Microps, is designed to allow a large and indefinite number of micros to function together. If one or more systems are down, missing or even added, the network must adjust dynamically to the new configuration.

Obviously, this means the operating system has a startup — and ongoing — task of configuration inventory, even prior to its resource and task allocation.

Eventually, Wittie hopes to link together 10 million micros in an attempt to simulate the human brain. But that accomplishment is off in the future somewhere, he conceded.

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3	6089	Tri-State Computer Corp.	22530	2375	09 DEC 77	1139.50	0.00	0.00	1139.50	1420	
3	6089	Tri-State Computer Services	25735	145	09 DEC 77	3490.23	0.00	0.00	3490.23	1420	
3	6089	Tri-State Computer Services	25735	145	09 DEC 77	0.00	33.77	33.77	33.77	1420	
3	6089	Tri-State Computer Services	25731	145	09 DEC 77	125.35	0.00	0.00	125.35	1420	
3	6089	Tri-State Computer Services	28342	4432	20 DEC 77	3490.23	0.00	0.00	3490.23	1420	
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3	6089	Tri-State Computer Services	24107	77100	28 NOV 77	608.60	0.00	0.00	608.60	1420	
3	6089	State Electric Company	2576721	77100	28 NOV 77	1167.35	0.00	0.00	1167.35	1420	
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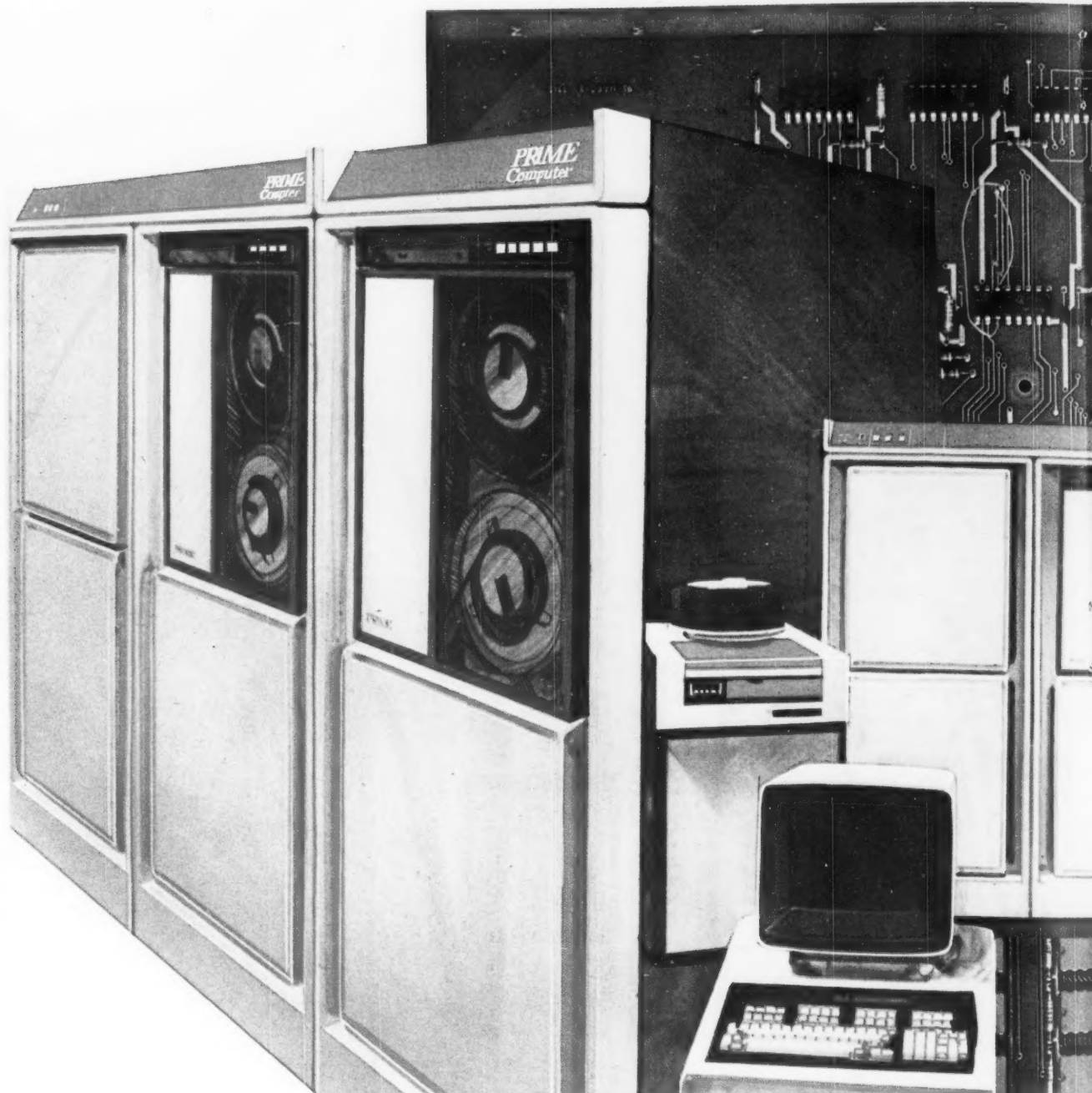
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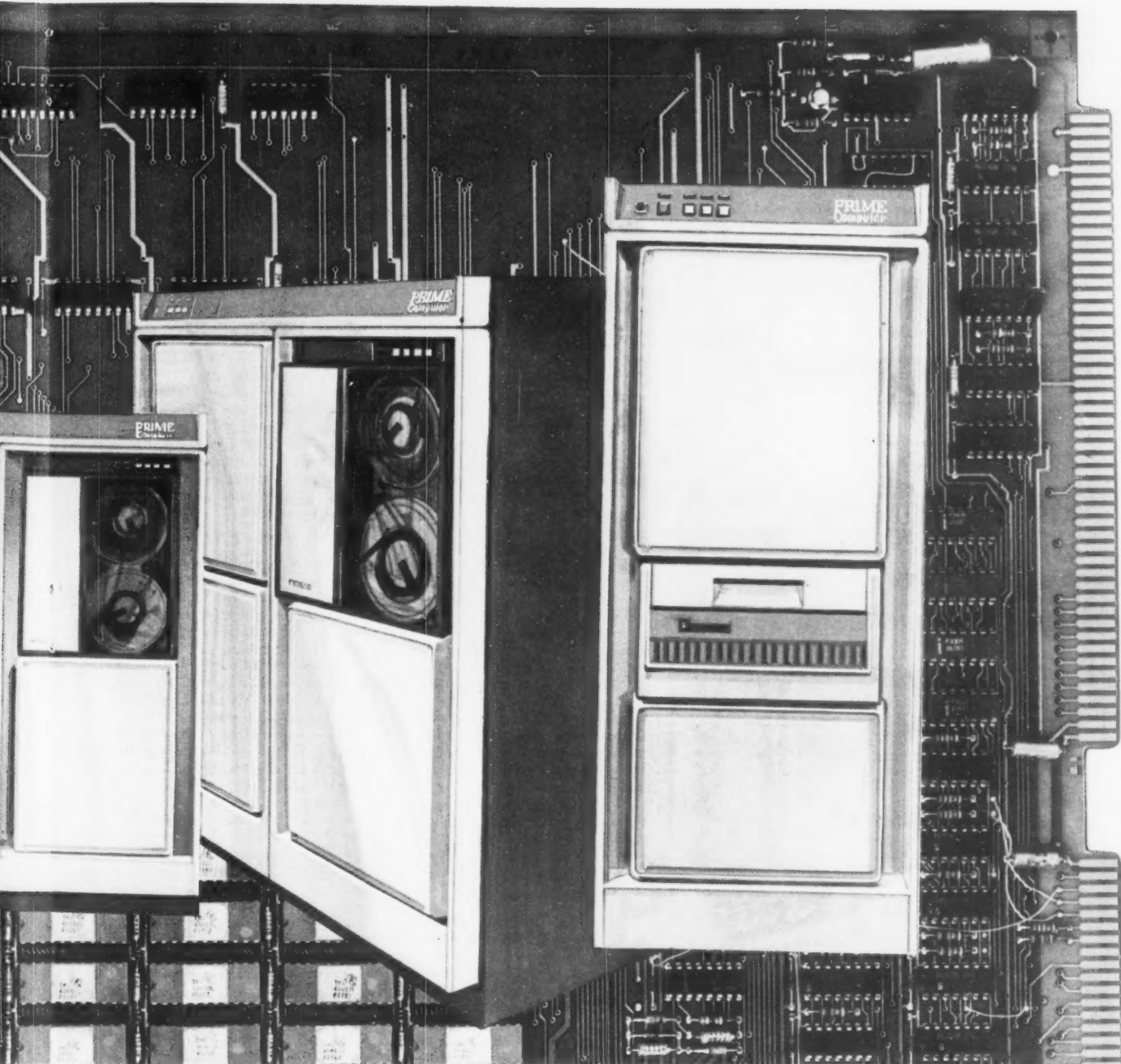
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Tire Company's DDP Gives Data Fast Ride

(Continued from Page 59)

Initially, we placed 64K-byte Sycor 410s, each with a CRT, a printer, a 5M-byte fixed disk and a cassette read/write device at each warehouse. At headquarters, we installed a Sycor 440 with the same peripherals as the warehouses, but with an additional 5M bytes of disk, a tape drive and two more CRTs.

Polling, Processing

Each day, headquarters polls the warehouses for orders, creating a magnetic tape of order information from all four warehouses. The tape is processed on the Univac system. Customer and product updates are transmitted back to the warehouse computer files

on the Sycor network.

Since installing the equipment at headquarters, additional applications have required us to update the Sycor 440 at headquarters with a 96K-byte Sycor 445, an additional printer, a magnetic tape cartridge to replace the cassette and a total of four CRTs.

Our warehouses are now functioning on-line, each with its own processor. They now have responsibility for their orders and their inventory. With inquiry ability into their order, product and customer files, they have better access to critical data. And the problems with the paper tape system have been solved.

What was the cost of all this? The total system costs us approximately

\$3,500/mo compared with \$500/mo for the system it replaced.

Despite the increased cost, we feel it is worth it, especially in terms of reduced noninvoiced orders, increased inventory and order control and workload reduction.

The programs on the systems were designed and written in a modular fashion, with a menu on each screen for operator training. To accommodate large programs in a limited memory

space, we use an overlay technique, with the major portion of the on-line system in one module to minimize program loadtime.

We have been fully exercising the capabilities of the software and hardware. Despite this, downtime has been minimal and response to maintenance calls has been excellent.

Venglarik is manager of systems and programming at McCreary Tire & Rubber Co.; Lingenfelter is a project leader with the company.

Management Inputs Ideas

(Continued from Page 59)

Warehouse activity is heavily dependent on computers. When an item is scheduled for shipment to a customer, data on the item — including weight and warehouse location — is transmitted to the warehouse.

This data, in turn, is grouped and analyzed by the system to ease workloads and provide for scheduling of work activities.

For example, several orders for the same item are grouped so the warehouse person filling the order does not have to walk far. In addition, the weight of the item is noted, so the person filling the order knows if he can carry more than one piece.

Although most of the company's DP equipment comes from IBM, it does have some peripherals from Storage Technology Corp. "We've been trying to maintain a minimal mixed-vendor situation — no more than two wherever possible," Bochenski noted.

"I don't like to get into multiple finger-pointing sessions when problems occur with vendors who have to maintain equipment. I've been in situations where vendors started pointing at the other guy and saying, 'It's not me; it's his equipment.'"

"We feel if we can keep it down to two and maintain a good working relationship with those two, it's a little easier that way. [But] it's strictly a personal preference," Bochenski said.

Two Major Responsibilities

Running the operation entails two major responsibilities for Bochenski. He has to "keep the on-line systems up and running smoothly" and find enough resources to develop the systems users want.

Keeping the system running smoothly is important not only because it is critical to the company, but also because the employees who enter orders are on a "bonus plan," which Bo-

chenski explained is similar to a piece-work type of arrangement. "Response time averages .6 sec, which is pretty good. Anytime our machines burp, we run into a problem, so uptime is very critical to us," he said.

Response time on the CRT network recently became more critical when the company closed down a number of outlying catalog stores. These stores had been submitting to the headquarters' store orders that were entered in a batch system. Phasing out this part of the operation meant all orders had to be entered on-line, increasing the system's workload.

Customer Predictions

DP at the company is not limited to accounting and order processing, Bochenski stressed. "The timing of issuing a catalog is critical for the company because you can anticipate various levels of order return."

"A major part of our business is determining to whom to send a catalog, whom to solicit. We use demographic and financial algorithms to do this."

"The ideal is to find a customer who is using our services. We work closely with our merchandising people to predict products' prices based on the products' purchase histories. This is part of the automated inventory system," he explained.

In the future, the company plans to implement, in several phases, an enhanced customer service system. This system will enable the company to tell a customer inquiring about an order "anything and everything" about it, Bochenski predicted.

"In this business, we are not talking to the customer face-to-face, so we had better do it right the first time. Normally, there is no second chance."

"We're striving for as high a level of prompt, courteous, efficient service as possible, and we're attempting to build systems to achieve that goal," he said.

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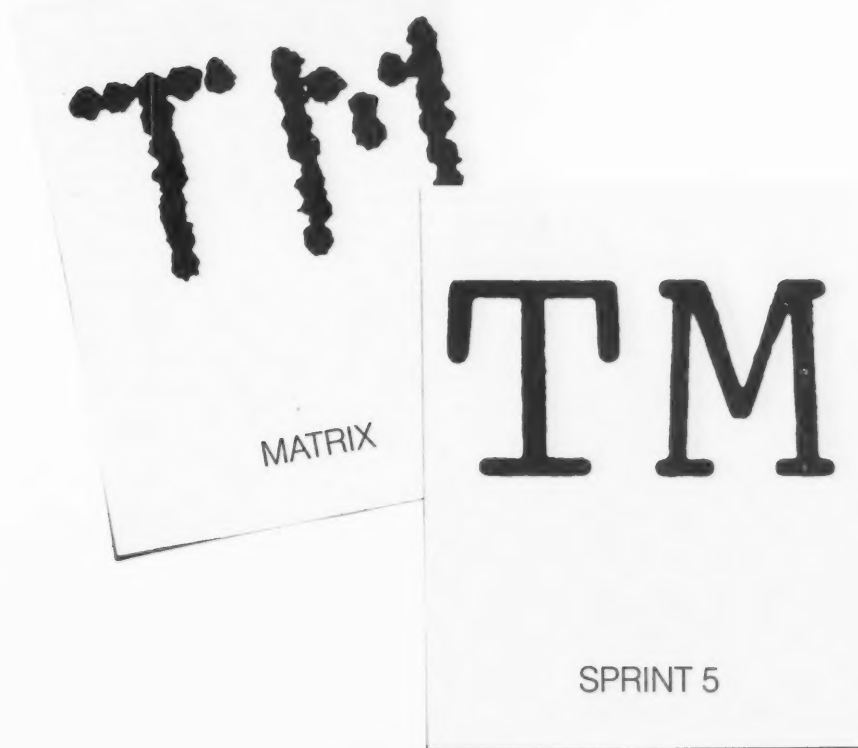
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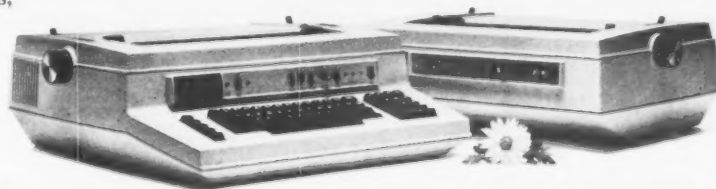
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Computerworld will explore the ins and outs of data entry in a special report in April. If you have an interesting story to tell about your particular system or data methods — or would just like to expound on the topic of data entry itself — we would like to hear from you.

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Manufacturer's On-Line System Paces Production to Demand

OAKBROOK, Ill. — By integrating a computer system into the manufacture of controls put into refrigeration and heating equipment, a company here is doing its part to alleviate some of the nation's energy shortage problems.

The system, which collects data directly from the shop floor and tracks the progress of customer orders, has helped the Penn Division of Johnson Controls, Inc. to improve its record of on-time shipments despite increases in sales last year.

The company's system links plants in Watertown, Wis., Goshen, Ind., and Dallas, Texas, to headquarters here, enabling managers to monitor all activities on the company's 1M-byte IBM 370/138.

"Our manufacturing operation is complex, with more than 4,000 different end products engineered to customer specifications. We use approximately 25,000 parts and components that often require more than 100 production steps, performed at widely scattered facilities," according to Chet Cripe, manager of management information systems for the division.

"The on-line system pulls it all together for us, pacing production to demand, keeping tabs on what is happening when and where and informing management at all levels on where we stand and how we're doing."

To accomplish all this, the company has linked to its mainframe two dozen CRTs, a number of IBM 3776 remote job entry (RJE) units and IBM 5230 data collection units. The CRTs — located both at headquarters and at the remote plants — are used to enter data about the status of operations and retrieve information needed by management.

The 5230s are used to collect production performance directly from the plant floors.

Processing Cycle

The on-line processing cycle begins with the entry of customer orders here at headquarters. When these are entered via the CRTs, they update the customer order master file.

In the case of a wholesaler order for standard stock control units, the system checks for warehouse availability and prepares the shipping releases so orders coming in one day go out the next.

If the order is from an OEM customer and requires manufacturing to specification, the system produces what division officials call a "screening sheet." This spells out the details of the order as entered — the customer, the gas or electrical controls required, the

quantity and the desired ship date.

Lacking only a firm production schedule date, the screening sheet is transmitted from the mainframe to the RJE unit at the appropriate manufacturing plant.

There, local plant officials check the incoming screening sheets against the plant's master production schedule, slotted by week and based on a sales department forecast of individual control unit demand. This forecast is periodically updated, taking seasonal variations into consideration and using exponential smoothing techniques.

After plant officials determine the production schedule slot and date for the new order, this is transmitted back to the central computer, which updates the open order file record and triggers a firm shipping date acknowledgment to the customer.

Two Documents

The system continually reviews the open customer order file and schedule production start dates and, at set advance-of-production intervals, produces and transmits to the plant's RJE units the production orders and job packets and necessary shipping documents. Along with the production job packet, the system also transmits a materials "kit ticket."

The former spells out the step-by-step job routing through the plant; the latter specifies the materials and quantities to be brought from the plant storeroom to the production line at the proper

times.

Another aid in materials management is a weekly report about the production schedule to net out requirements from finished product down through seven bills-of-material levels. The system's output indicates what materials must be ordered and which parts and components to put into production.

Production Control

The production control aspect of Penn Division's on-line system stems largely from the IBM 5230 data collection units at the plants. At Watertown, for example, there are some 18 data entry units. Three of these accept employee badge entries and automatically clock in and clock out workers for daily attendance reporting.

The remaining 15 units are scattered around the plant, positioned for access from any workstation.

These units accept both job cards from the production order packet that accompanies a production order through the plant and employee identification badges. They also provide a simple keyboard so workers can enter production counts.

The data collected as transactions occur on the plant floor is sent directly from the IBM 5230 entry station to a diskette record maintained in the plant's IBM 5230 control unit. After the work shift, the diskette data is transmitted via the plant's IBM 3776 RJE unit to the central computer, which updates open order file records.

Mr. Field Service

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System Boosts Mini Power PCC Simplifies Group Code Recording

CHATSWORTH, Calif. — A magnetic tape technology to increase processing capability through dense data packing has been simplified for minicomputer users by Pertec Computer Corp. (PCC).

Called Group Code Recording (GCR), the technology has until now required expensive support and maintenance, the vendor claimed. PCC has developed a GCR system with a self-diagnostic capability that reportedly eliminates the need for

highly skilled service technicians and costly test equipment.

The unit includes PCC's F6250 intelligent formatter, which executes tape drive management as well as GCR phase encoding and decoding, according to a spokesman.

Most of the tape-dependent functions have been built into the formatter, relieving the host CPU and controller of considerable design demands, he said. The formatter was "designed to perform 90% of the controller's job."

The formatter interface communicates with the host minicomputer over a 28-line bus, he added, noting that competitive units employ 53- and 64-line buses.

The F6250 employs a 16-bit control/status/data (CDS) bidirectional bus, five common address space (CAS) address lines and six handshake control lines.

Tri-Level Diagnostics

"Perhaps the most important feature of the formatter for the

1980s' [user] is its three-level self-diagnostics that allow trouble-shooting without test equipment," the spokesman said. Subsystem operation can be verified in off-line mode at the formatter panel keyboard by a technician without interaction with external test equipment.

The first level of diagnostic operation provides the CPU with a continuous report of performance and alerts the CPU in the event of a fault. The on-line procedure employs standard operational interface codes, interrupt and failure, in conjunction with the motion interrupt (Mint) and data interrupt interface lines whenever the formatter is engaged.

A subset of the on-line diagnostics also occurs when the formatter is not performing a host-directed function. This "self-policing" mode reports any faults to the host CPU using formatter-initiated interrupts and the Mint interface line.

In the "idle mode," the formatter's 8085 microprocessor calls up self-test routines for execution; as the micro polls individual microsequencers associated with each module of the formatter, various test patterns of data are routed through the module to verify proper functioning, PCC said.

Off-Line Diagnostics

A second level of diagnostics operates off-line and requires use of the formatter's built-in key-
(Continued on Page 78)

Efficiency, Accuracy, Savings

State Treasurer Gets Triple Dividend

Special to CW

BOSTON — Efficiency, accuracy and cost savings are the dividends of an on-line minicomputer system implemented in 1975 in the Massachusetts State Treasurer's Office by current State Treasurer Robert Q. Crane.

Crane, now starting his fourth full term and 15th year as state treasurer, felt his increasingly complex job required "the combined professional resources of a corporate treasurer, a mutual fund president, a municipal fi-

nance expert and an economist."

The commonwealth's on-line cash management system, built around a Burroughs Corp. B1728 minicomputer with 256K bytes of main memory, deals with a daily cash flow often exceeding \$225 million.

The configuration includes 16 Burroughs B9486 disk drives, each with 75 million words of memory; four B9495 tape drives; two Model 9246 2,000 line/min printers; one Model 9111 reader; and three Model 9499 control-

lers.

Twenty-six systems specialists, programmers and key punch operators staff the Treasury's computer division, offering service in four areas: cash management, retirement management, management system consulting and forecasting management.

Each year, three million checks are issued to pay the commonwealth's bills, and the Treasurer's Office pays 39,000 of the 70,000 state employees directly.

Beating the System

Through a competitive bidding situation initiated by Crane, it was discovered that the lowest price for check processing and account handling offered by banks to any of 57 independent state agencies was 9 cents per
(Continued on Page 74)

Multidensity Tape Unit Designed for 7/32, 8/32

HOUSTON — A multidensity IBM/Ansi-compatible tape subsystem for Perkin-Elmer Corp. Computer Systems Division's 7/32 and 8/32 minicomputers has been announced by Information Products Systems, Inc. (IPS).

The subsystem includes an IPS Model 1600 multidensity tape controller, Telex Corp. Model 6840 and/or 6850 magnetic tape formatter and Telex Model 6240 and/or 6250 tape transport.

The subsystem supports data transfer rates between 72K byte/sec (800 bit/in. at 45 in./sec) and 781K byte/sec (6,250 bit/in. at 125 in./sec), IPS said.

Standard Drivers

The tape subsystem is used in conjunction with the standard Perkin-Elmer selector channel (Bselch or Eselch) and standard Perkin-Elmer Dynamic OS/32 MT software drivers for 9-channel magnetic tape peripherals.

Because of its relatively high transfer rates, the subsystem cannot be used on slower speed multiplexer channels, a spokesman noted.

The Model 1600 tape controller supports either four or eight Telex tape transports in any speed and density combination, he added.

Dual-density single-drive systems are priced from \$19,345. Triple-density dual-drive sys-



IPS Tape Subsystem

tems are priced from \$46,015. IPS is at 6567 Rookin, Houston, Texas 77074.

Univac V77-600 Gains Error-Correcting Memory

IRVINE, Calif. — Univac's Minicomputer Operations (MCO) has announced a semiconductor memory with automatic error-correcting circuitry and a storage capacity of 256K bytes on a single board as an option for the V77-600 minicomputer.

The memory detects multiple-bit errors, corrects single-bit errors and features a 660 nsec cycle

time, the vendor said. With dual-port access, the memory permits two different processors, operating independently, to request access to the memory concurrently.

One of these two requests will acknowledge when access priority has been resolved by the memory's priority logic, a spokesman noted.

The memory is available with either 128K- or 256K-byte capacities on a single 15.6- by 19-in. printed circuit board that plugs directly into the V77-600 chassis. The single-board feature saves physical space in the V77-600 and reduces the hardware costs associated with memory, the spokesman said.

As many as eight boards can be installed in a V77-600 for a maximum capacity of 2M bytes, he added.

The 256K-byte version costs \$12,000, while the 128K-byte version is tagged at \$7,000.

Varian Data Machines, Inc. introduced the V77-600; Univac acquired Varian in 1977 and renamed the organization MCO. The mini maker's address remains 2722 Michelson Drive, Irvine, Calif. 92664.

Newsletter Watches GSD

ORANGEBURG, S.C. — A monthly newsletter dealing with developments in IBM's General Systems Division, GSD, as well as rules and regulation changes that might affect related DP activities, is now available from Ziegler and Company, Inc.

The newsletter will cover developments affecting the IBM System/34, System/32, System/38, Series 1, System/3 and 5110. It will also offer suggestions for better internal control and attempt to assess the impact of announcements from IBM.

In addition, the publication will forecast the pricing and availability of supplies such as forms and diskettes.

Periodically the newsletter will announce general-purpose software products to be made available to subscribers inexpensively. For example, the first software offering is a letter writer package for the System/34 priced at \$100.

The newsletter costs \$25/year. A free copy of the first issue will be sent upon request. Ziegler and Co. is at 1173 Boulevard N.E., Orangeburg, S.C. 29115.

MULTIMEDIA

Handles Industry-Standard Tape Drive Controller Ties PDP-11, TU10/TM11 Systems

IRVINE, Calif. — A tape controller designed to give users of Digital Equipment Corp's PDP-11 minicomputer compatibility with DEC's TU10/TM11 tape subsystems is available from Emulex Corp.

The Emulex TC-11 controller can be used with any industry-standard reel-to-reel magnetic tape drives to a maximum speed of 125 in./sec. A nonreturn-to-zero (NRZ) version can be installed in a single slot of the user's backplane or system unit, while phase-encoded and dual-density versions require two slots, the vendor said.

The TC-11 executes all DEC PDP-11 system and diagnostic software without modification, a spokesman claim-

ed. The unit's firmware includes a comprehensive set of controller self-test and extended subsystem diagnostics, he added.

"We have designed the TC-11 exclusively for use with the PDP-11 computer," the spokesman said. "Because it is not merely a 'universal' controller that is adapted to operate on a Unibus, its packaging and performance have been optimized in all respects" for that processor.

PDP-11 users will find the TC-11, combined with any standard tape drive capable of emulating all functions of a TU10/TM11 subsystem, including execution of standard diagnostic programs, the spokesman continued.

The TC-11 can be used with as many as four tape drives operating in any combination of seven or nine tracks at densities up to 1,600 bit/in. and at speeds up to 125 in./sec, the vendor stated.

The unit can perform at a cumulative cable distance of 50 ft from the host CPU. Overlapped tape rewinds are permitted.

The controller interfaces via the controller board only to any standard slot in the backplane and presents only one unit load on all lines, Emulex said.

Data can be packed in either DEC or IBM formats, the spokesman added. Both 7- and 9-channel IBM format tape drives can be handled together,

and users can reportedly edit previously recorded data.

Crystal Clock

The TC-11 meets all specifications over wide voltage margin and clock margin ranges, Emulex said. Timing is generated by a crystal clock.

Conservative derating is made on all components and environmental ranges exceed those of all commercial PDP-11 host computers and applicable industry tape drives, the spokesman claimed.

In quantities of 50, the NRZ version of the TC-11 controller costs \$2,250; the phase-encoded and dual-density versions cost \$2,700. Deliveries will begin next month, Emulex said from 17785 D Sky Park Circle, Irvine, Calif. 92714.

PDP-11/70 Gets Mass Storage

W. EATONTOWN, N.J. — Diva, Inc. has introduced a family of mass storage subsystems for Digital Equipment Corp's PDP-11/70 minicomputer that are said to fit that processor's cache memory feature.

Diva's DD 780, 7100, 7200 and 7300 subsystems function as disk controllers for the PDP-11/70; they allow the user to mix and match drives of different sizes and speeds, Diva said.

As many as eight disk drives per controller can be accommodated, allowing a total disk capacity of 2.4G bytes. The basic component of these storage units is Diva's Computroller V, which the vendor said can achieve a maximum throughput of 1,209K byte/sec.

Uses RH70 Location

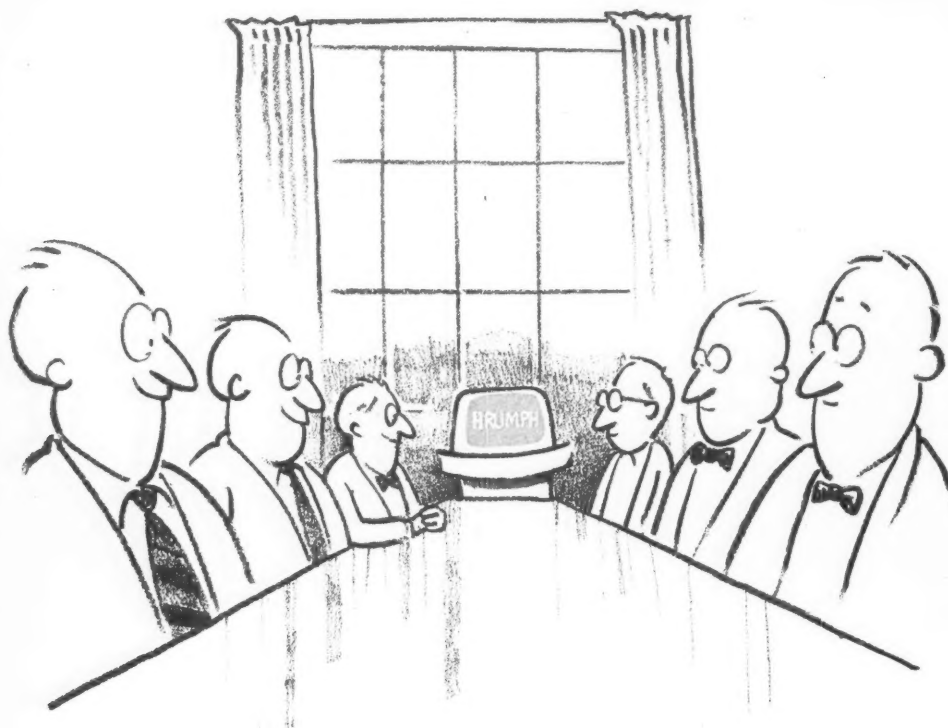
To take advantage of DEC's cache memory for the PDP-11/70, the Diva devices use one of the processor's RH70 locations to form a high-speed cache bus interface. The devices are software-transparent to operating systems such as DEC's RSTS and RSX-11, Diva said.

All current comptroller Vs with U-class emulators can be field-upgraded from a DEC Unibus operation to form the PDP-11/70 cache interface, Diva added.

The DD 780 is priced in the low-\$20,000 range, a spokesman said. The vendor's DD 7100, 7200 and 7300 subsystems cost in the mid-\$20,000 range, he continued, explaining that costs vary depending on the configurations specified.

Diva is at 607 Industrial Way, W. Eatontown, N.J. 07724.

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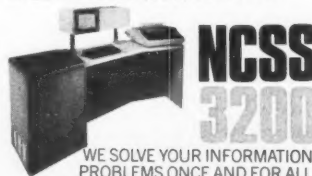
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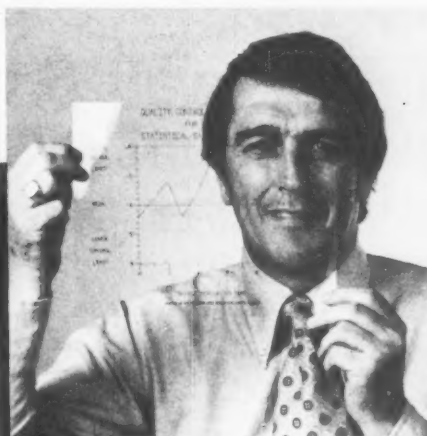
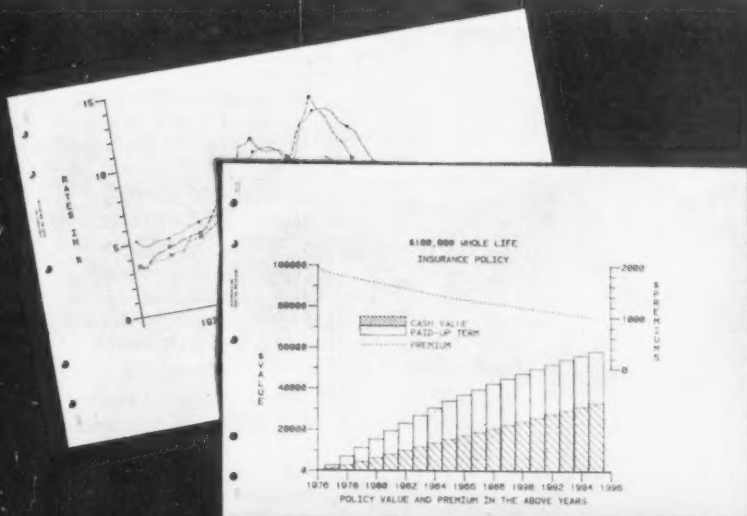
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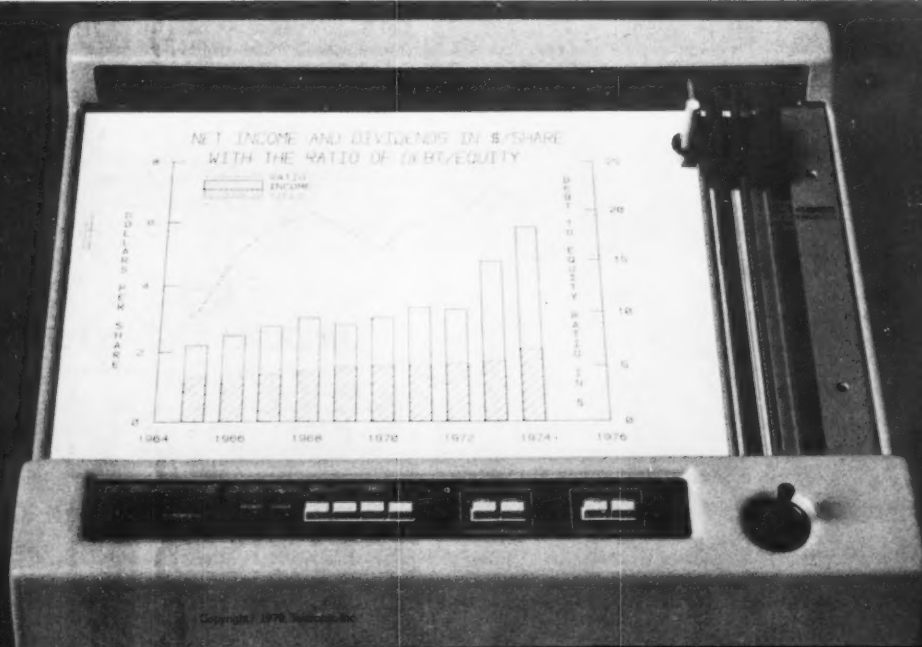
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Mini Helps Native Americans Manage Land

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TAHOLAH, Wash. — An interactive minicomputer is playing an important role in helping the Quinault Indian Nation, located here on Washington's Olympic Peninsula, to restore 190,000 acres of reservation land as manageable forest property.

The Prime Computer, Inc. 400 CPU was installed in June 1977 to maintain forestry and fishery records, analyze field data and provide information germane to land acquisition. The system was also intended to support the development of

feasibility and research studies, the evaluation of management policies and to simulate resource production models.

The CPU is configured with 256K bytes of main memory; one 80M-byte storage module disk; one 9-track, 45 in./sec tape drive; one 200 line/min printer; three phone ports; seven terminals and four Prime Execuports.

The Quinaults primarily use Fortran. They also write in Cobol and Basic and plan to add an RPG-III package.

The Prime 400 is also expected to support a computer-assisted education program that will help train Quinaults to assume full responsibility for management of their reservation.

For seven years, the Quinaults had relied on an outside time-sharing service that reportedly required several days to deliver information to reservation management. But the Prime 400 has trimmed turnaround to several minutes, allowing the Quinaults more time for data analysis and policy development.

Salmon Economy

The lives of the Quinault Indians historically have been tied to the salmon that return to their rivers each year. The runs of chinook, coho, chum, steelhead and blueback salmon formed the basis of the Quinaults' economy.

The Indian nation settled along the Olympic river banks in small family groups to harvest and process the salmon. There was no formal government, and land ownership was an alien concept. The land, ocean and rivers were part of a spiritual and cultural heritage that could not be bought or sold.

By the late 1700s, the Quinaults' way of life had changed drastically as a result of explorations by the Spanish, English and Russians, who hunted for furs and searched for the fabled Northwest Passage. The U.S. acquired nearly a third of the Olympic Peninsula in 1855 and, two decades later, President Ulysses S. Grant established 300 sq miles within the peninsula as the Quinault reservation.

Although the coarse, gravelly soil of the Quinault land was largely unfit for agricultural use, the federal government allotted parcels of the reservation to individual Quinaults in an attempt to assimilate the Indians into the mainstream of American life.

Virtually all of the land was allotted by 1933. By that time, many millions of dollars worth of timber had been harvested from the reservation's forest areas under the supervi-

sion of the Bureau of Indian Affairs (BIA).

Allegations that the BIA had mismanaged the Quinault resources sparked a Congressional probe of the situation and resulted in four lawsuits filed by the Indians against the bureau.

Today, the Quinaults are reportedly trying to restore their land and reduce their federal dependence by establishing tribal-controlled forestry programs, fisheries and businesses; acquiring more land; and implementing training programs to develop marketable skills.

Inventory of Resources

The Quinault forestry program maintains an inventory of available resources that entails the use of satellite and aerial photographs in generating map overlays and color-coded summaries to represent vegetation patterns.

Information about the number, size and condition of tree and brush species, as well as slope and soil data, is routinely collected during field surveys.

After the information is collected, it is processed and analyzed with the Prime 400 mini. The system is also used to develop feasibility studies indicating which forestry and fishery projects have the best chances for commercial success.

The Prime 400 measures and tracks timber harvesting operations and assists in a number of accounting applications. According to the Quinaults, one benefit of the system is that it strengthens professional discipline among their resource managers. In the process of transforming raw information into usable data, the staff not only must be aware of the need to collect the information efficiently; they must also specify the assumptions behind their decisions.

"Taking action without adequate information is a dangerous practice that can result in serious consequences," according to Gary S. Morishima, technical advisor to the Quinault Nation's department of natural resources and economic development. "The Prime system helps us make the right decisions in our effort to rehabilitate and manage our reservation's natural resources."

Consolidation Effort

Land allotment practices have fragmented the Quinault Nation, making management of the forestry program difficult. However, a consolidation effort involving land purchases and cooperative management of private properties and relying on the Prime mini

for the storage and analysis of the real estate data is now under way.

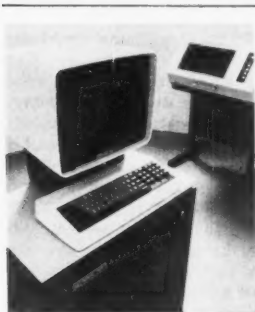
The Prime 400 aids the fishery program by supporting studies of salmon migrations. The system reportedly helps reduce delays in restocking and minimizes mortality losses.

More than 20 fishery applications are planned. They include analysis of the relation between stock density and salmon production, formulation of salmon diets and analysis of salmon reproduction. The Prime 400 is also slated

for use in hormone experiments, stress reduction testing, vaccine development, disease resistance studies and estimation of the volume of salmon runs.

Several simulation models are expected to help evaluate the impact of various fishery activities on the reservation's economy.

The outside time-sharing service previously used by the Quinaults was based 150 miles from Taholah. Communication costs were high and processing time was inconvenient, Morishima said.



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On-Line Mini Gives Treasurer Three Dividends

(Continued from Page 69)

item. The bids were based on the assumption that the banks would provide full reconciliation services, whether or not the agency had computer capabilities, Crane explained.

The Treasurer's Office, however, accepted a bid of 3 cents per item thanks to the system's on-line nature, which allows daily reconciliation of all the major checking accounts — averaging \$23 million and 19,000 computer transactions daily.

"Although many commonwealth banks advised that reconciliation could not be accomplished in-house, it's being done," Crane said. "The result is a minimum savings of approximately 6 cents per check or a total savings of approximately \$180,000 on the three

million checks processed yearly.

Daily reconciliation also provides verification in the event discrepancies occur either in the check number or the amount encoded by the banks. It provides a safeguard feature against duplicate payments as well.

Monthly Statements

Each day the processing bank sends a magnetic tape reflecting all checks processed for the 57 agencies to the Treasurer's Office, which in turn compiles the information and issues monthly statements to each agency. The statement includes the beginning balance, the total deposits, all credit and debit memos input through CRTs, daily hits and an ending balance that must match the bank's statement.

All discrepancies are noted and corrected on the following day's tape. Since the checks are returned on a weekly basis, the Treasurer's Office waits a maximum of seven days for a cashed check. Crane noted, however, that any cashed check can be retrieved in 24 hours if necessary.

Another advantage of the system has been a reduction in turnaround time for lost checks from 30 days to 24 hours — 48 hours for some large vendor checks. The 30-day period, was necessary because all information had to be researched manually and communications depended on the Postal Service, Crane explained.

Now the Treasurer's Office does a check through a CRT, sends out a stop-payment order by telecopier to

the processing bank if the check has not been cashed, receives acknowledgment by telecopier and issues a new check.

Retirement Management

The retirement management portion of the system stores information on the retirement accounts of all past and present state employees. A total of 145,000 state employees are covered, 70,000 of whom are presently employed.

The system keeps a 10-year history file for each employee detailing his individual monthly contributions to the retirement system. The file is updated monthly.

All the information is available in two seconds or less through the use of eight terminals. Six of the terminals are Burroughs Model TD800s, one is the model TD820 and one is the Model TD830.

This system has allowed the Treasurer's Office to offer a direct payroll deposit service to all state employees, an option that became available for retired state employees as well last March. "The direct deposit program for retirees is already the largest of its kind in New England region, and when all the interstate link-ups are completed sometime this year, it is estimated that it will be the largest system in the nation," Crane said.

Consulting Service

In addition to reconciling agency checks and verifying warrants issued by the various state agencies, the computer staff of the Treasurer's Office also provides a voluntary consulting service for these agencies.

Every year, a listing is run for the Office of the Secretary of State to segregate those corporations in Massachusetts that haven't paid their annual report fees.

In order to obtain the maximum return on the funds the Treasurer's Office has to invest for the commonwealth, the investment officer must know what the Treasurer's Office is taking in and paying out on a daily basis, Crane pointed out.

Through the use of the computer, information with respect to the warrants drawn up and payable weekly and the checks cashed daily for the Treasurer's Office and the agencies is instantly available, he said.

After reviewing a daily statement of money paid out and funds taken in, the investment officer can make effective investment decisions.

In 1978, he noted, these forecasting tools enabled the investment division of the Treasurer's Office to have earnings in excess of \$31.1 million.

Kit Expands PDP-11

OTTAWA — An upgrade kit for Digital Equipment Corp. PDP-11/03 mini-computers has been announced by K.O. Mair Associates Ltd.

The kit is said to fit into 5.25-in. rack space and to increase PDP-11/03 capacity from a four-slot to an eight-slot backplane. The backplane will reportedly accommodate an RL01 disk controller as well as up to 12 dual-size boards.

The kit costs \$550 (Canadian) from Mair at 40 Beech St., Ottawa, Ont. K1S 3J6, Canada.

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Printers for Low-Cost Systems
Packaged Software
Impact vs. Non-Impact Printers

1. NEW YORK — Mid-Atlantic Computer Expo, New York Coliseum, (212) 757-5000, March 13, 14, 15
2. CHICAGO — Midwest Computer Expo, McCormick Place, (312) 791-6000, March 27, 28, 29
3. ST. PAUL — Twin Cities Computer Expo, Civic Center, (612) 924-7361, April 3, 4, 5
4. SAN FRANCISCO — Northwest Computer Expo, Civic Auditorium, (415) 558-5065, April 17, 18, 19
5. LOS ANGELES — Southern California Computer Expo, Alhambra Convention Center, (213) 741-1151, April 24, 25, 26
6. HOUSTON — Southeastern Computer Expo, Greater Houston Convention Center, (713) 222-3561, May 8, 9, 10
7. CHARLOTTE — Southeastern Computer Expo, Greater Charlotte Convention Center, (704) 275-3600, May 15, 16, 17
8. PITTSBURGH — Northeastern Computer Expo, John B. Hynes Auditorium, (412) 243-8716, May 22, 23, 24
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MOS on Card High-Density Memory Compatible With PDP-8/A

IRVINE, Calif. — A 128K-word by 12-bit semiconductor memory for the Digital Equipment Corp. PDP-8/A minicomputer is being offered by Plessey Peripheral Systems.

The PM-S8A hex card memory reportedly plugs directly into the CPU chassis and occupies a single slot, precluding the need for an additional chassis.

Mimi '79 Set At End of May In Switzerland

ZURICH, Switzerland — The Fifth Annual International Symposium on Mini and Microcomputers and Their Applications (Mimi '79) will be held at the Kongresshaus Zurich May 22-25.

Sponsored by the International Society for Mini and Microcomputers, the symposium is intended as an international forum for the presentation and discussion of recent advances in all aspects of minis and micros and their applications.

List of Topics

The list of topics to be covered at the symposium include hardware, software engineering, distributed processing, computer networks, maintenance and management of software and education.

Data acquisition, instrumentation, manufacturing, transportation and business will also be discussed.

Inquiries and proposals can be directed to the Secretary, Mimi '79, P.O. Box 354, CH-8053 Zurich, Switzerland.

'Notes' on Multibus Free From Mupro

SUNNYVALE, Calif. — Available free of charge, a series of notes intended to inform and aid anyone utilizing Intel Corp.'s Multibus is being offered by Mupro Corp., manufacturer of Multibus-compatible memory boards.

The "MBC Memory Series Notes" begins with a note addressing the "Importance of Error Detection," illustrating failure modes and corrective action.

Mupro is located at 424 Oakmead Parkway, Sunnyvale, Calif. 94086.

Designed to replace DEC's MS8-C memory while providing increased capacity, the PM-S8A is available in eight depopulated versions ranging from 16K to 112K words.

Battery Backup

Features include a battery backup power supply and switch-selectable addressing. The unit is hardware- and software-compatible with the PDP-8/A and all DEC peripherals, according to a spokesman.

The PM-S8A with 128K words of memory costs \$4,470 from Plessey Peripheral Systems, 17466 Daimler, Irvine, Calif. 92714.

Free Catalog Offered

SUNNYVALE, Calif. — A free 64-page winter catalog from Mini-computer Accessories Corp. describes more than 800 products, ranging from line-printer ribbons to binders offered by the firm.

Other products available include print wheels, computer paper, binders, programmers' aids and media storage cabinets designed for security and protection, according to a spokesman.

The catalog also offers a line of DP furniture, in-stock cables and connectors available on a 24-hour shipment basis, plus cables designed and built on a modified standard or custom-built basis, the spokesman said.

New to the company's product

line are flexible disks sold in bulk quantities of 60, 200 and 400. These "no frills" disks come in vinyl jackets to help cut the cost of the usual prepackaging in envelopes and file boxes, according to the firm.

Another addition to the catalog is the Mini-computer Accessories Type Cleaner that reportedly allows a user to clean a line printer's type face in 10 minutes without leaving residue that might clog the printer mechanism.

The company ships most orders within 24 hours from either its California warehouse or its New Jersey warehouse. The free catalog is available through Department P-10, 130 S. Wolfe Road., Sunnyvale, Calif. 94086.

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By Harry Katzan, Jr.

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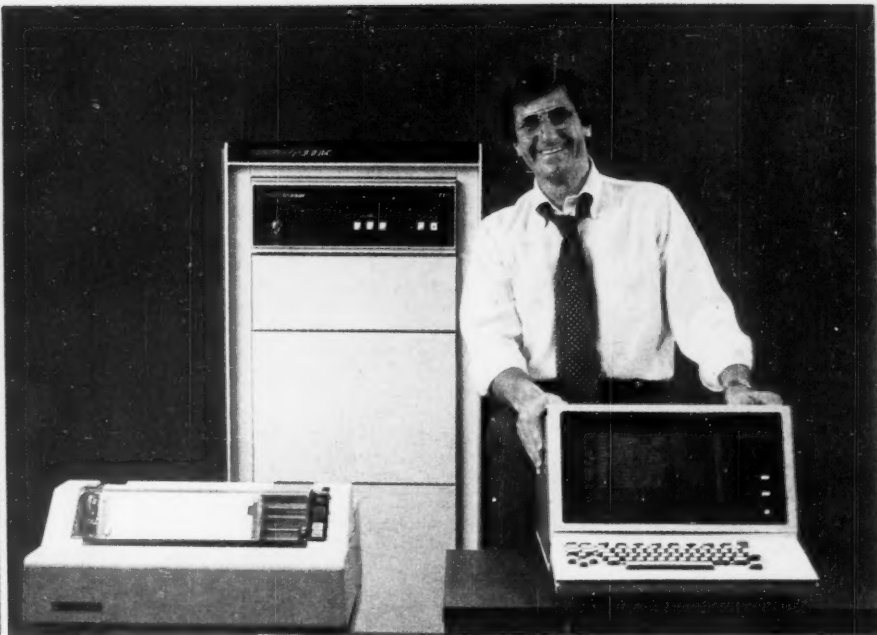
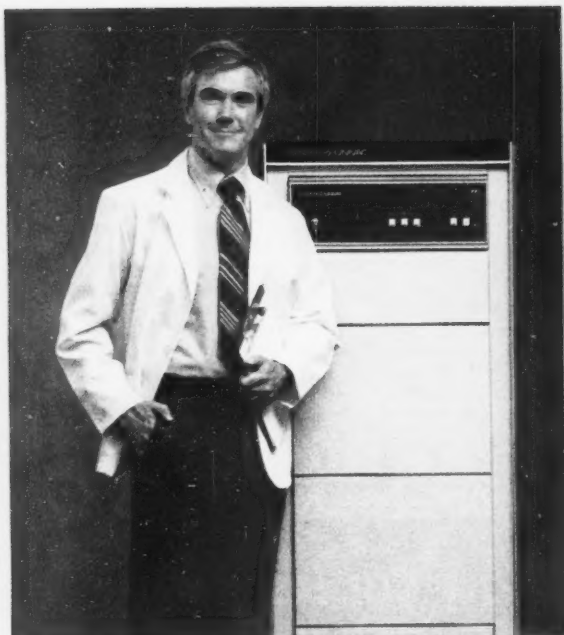
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LSI-11 Gets Expanders

MANSFIELD, Mass. — A series of peripheral analog-to-digital slave expander boards that enlarge Digital Equipment Corp.'s LSI-11 microcomputer to a maximum of 32 differential or 64 single-ended channels is available from Dattel Systems, Inc.

The ST-LSI-ADX expander printed circuit boards slide into and interface directly with the LSI-11's bus, Dattel said. Several master-slave card pairs can be linked together for indefinite channel expansion if sufficient additional card slots and power is available from the LSI-11 bus.

Two types of ST-LSI-ADX boards are available: the ST-LSI-ADX32S, which reportedly provides an additional 32 channels (single-ended), and the ST-LSI-ADX64D, which provides an extra 16 channels (differential).

The latter slave expander requires a Dattel programmable gain or differential instrumentation amplifier option that is available on the ST-LSI-11 master control board.

The ST-LSI-ADX board costs \$295, Dattel said from 11 Cabot Blvd., Mansfield, Mass. 02048.

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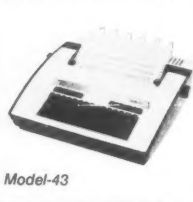
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Winchester, Floppy Drives Mixed Disk Boosts Throughput 40%

IRVINE, Calif. — A disk system that reportedly combines Winchester and flexible disk technologies and utilizes channel command communications to increase disk system throughput 40% is available from the Remex Division of Ex-Cell-O Corp.

The Remex Data Warehouse mass memory system was designed for microcomputer and small to medium-size mini-computer systems. Its Winchester fixed-disk drive has a capacity of 20M bytes; the unit also incorporates two Remex removable flexible disk drives providing capacities up to 2M bytes, according to a spokesman.

The three drives are controlled by a 6800 microprocessor-based embedded controller/formatter. The entire system with power supply is housed in a 19-in. rack-mountable package.

Remex's Channel Command Control communications technique permits the transfer of

data and command structures via direct memory access (DMA) to and from the host computer, minimizing the communications required between the disk and CPU and improving throughput by 40% over standard disk systems, the spokesman claimed.

Packet Chaining

The use of microprocessor control and the DMA function in the Data Warehouse are said to make possible capabilities previously associated with large disk systems.

Such capabilities include transferring up to 64,000 words of original data at a single command, regardless of cylinder or sector boundaries; packet chaining; and packet chaining in non-contiguous memory to support virtual memory systems.

Any devices not used in the copy function remain on-line to the host, Remex said. Other capabilities include subsystem troubleshooting by means of a

maintenance packet without need of a service tool; automatic error recovery routines; and full pack formatting by a single command.

Data Buffering

The Data Warehouse features data buffering of 2K words, allowing for a constant transfer rate under varying CPU conditions, according to the spokesman.

Transfer rates were quoted at 7.7 MHz for the fixed disk and, for the flexible disk, at 3.125K byte/sec in single density and 62.5K byte/sec in double density.

Interfacing of the Data Warehouse to any CPU is simplified by the system's parallel, word-oriented, bidirectional data bus, Remex said.

The Model RDW 3100, a single-headed, dual-density version of the Data Warehouse, costs \$8,700 from Remex at P.O. Box C-19533, 1733 Alton St., Irvine, Calif. 92713.

Group Code Recording Simplified

(Continued from Page 69)
board. This allows the service technician to call up the same self-test routines as in the on-line diagnostics procedure to verify each module's integrity.

Moreover, a loop write-to-read command can be executed within the formatter at real-time rates. This test is said to fully verify the read and write paths within the formatter.

Another routine can be summoned to extend the write-to-read loop test, allowing verification of the radical interface to the tape units, the spokesman said.

The technician can summon tape transport test routines from the panel keyboard, including rewind, write tape mark, erase gap, forward space, reverse space, write phase encoding, write GCR, read forward and read reverse.

Dedicated Mode

A third level of diagnostics employs the host CPU in a dedicated diagnostic mode and provides about 50 interface test messages. A set of decision-flow diagrams is provided with the formatter to form the source program for the generation of software drivers that execute the diagnostic program.

The first portion of this procedure substitutes the host CPU as master, using the formatter's microprocessor as slave. In this test, the CSD bus/CAS memory interface is reportedly verified, as well as the control path of the formatter.

The test messages, including error message listings and in-

terpretive text, provide the technician with details on the status of the formatter interface, its microprocessor and the control path, PCC said.

The second portion of the procedure consists of 24 separate microdiagnostic packages, each designed to check the various modules, submodules or individual circuits of the formatter.

The codes are loaded by the host CPU across the interface, with the formatter microprocessor acting as master and the

host as slave, PCC said. Each package typically consists of 25 separate tests and checks a portion of the formatter, returning error messages that isolate faults to individual components.

The results of the approximately 600 tests are distilled to a handful of usable error messages by the formatter.

A single GCR system costs \$10,995. In quantities of 100, the systems cost \$8,245 each, PCC said from 9600 Irondale, Chatsworth, Calif. 91311.

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School Boasts First Training Marathon

By Ann Dooley
CW Staff

SAN ANTONIO, Texas — Flagpole-sitting was for the birds and jump rope contests were all ups and downs, so a group of high school students here programmed their way into what they hope will be history by staging an eight and a half day microcomputer training marathon.

The students hope their effort will get into the *Guinness Book of World Records*, but the publishers would have to create an entirely new category for the event. Categories for the largest or the oldest computer are entered in the book, but no one has ever attempted a computer marathon before, and the publishers are reportedly reluctant to begin new categories.

Nevertheless, the 370 Holy Cross High School students who took part in the around-the-clock event are confident their accomplishment will be mentioned.

The idea for the marathon came from Brother Dennis Doose, chairman of the Holy Cross science department. The school had obtained its first microcomputer system — a Radio Shack TRS-80 — earlier in the school year for use by the math classes.

"There was such enthusiastic



Their parents may have swallowed goldfish to make history, but these students at San Antonio's Holy Cross High School found a more logical way to break a world's record — an eight-day, around-the-clock computer training marathon.

student response that I wanted to expose as many students as possible to it," he said.

Since funds were limited, the idea for a marathon slowly evolved. A local Radio Shack store donated 22 microcomputers for the event.

The response was "fantastic,"

according to Doose. Students were lined up at the door when the computer training marathon began at 7 p.m. on Friday, January 12. About 206 hours later, when the marathon ended, students and onlookers were still crowding into the area.

The time period was chosen so

Radio Shack could get its machines back in time to meet its demands.

Students were allowed to sign up for only two hours at a time so that everyone who wanted to participate could have a chance. They were very good about showing up at their scheduled time — unfortunately for a number of students who stayed around in case there was an empty seat, Doose said.

At least two micros were in constant use throughout the marathon, which ended at 9 a.m. Sunday, Jan. 21.

Even though most of the students had never used a computer before, "everything went very smoothly," Doose said. There were a few minor equipment failures, but in each case Radio Shack solved them by either sending a repair person to the site or taking the machine back to its office.

Three relief teachers and seven of the more advanced students were constantly on hand, rotating hours, to help beginning students. These aides, as well as Doose, brought sleeping bags to

(Continued on Page 80)

Works With Innova-Stak

Debugging Software Backs 6800

NEW YORK — Innova-Sdump M6800-1.1, a debugging tool that provides a variety of formatted dumps of the stack maintained by Innova-Stak, is being offered by 6800 microprocessors by Innova Systems, Inc.

Coded calls to Innova-Sdump enable the user to obtain dumps of the entire stack from the top down or the current frame. If a top-down request is issued for a stack whose topmost frame has been destroyed, Innova-Sdump attempts to dump the stack from the bottom up, the vendor said.

The package permits its binary-to-alphabetic translation and

print routines to be replaced, so it can be used with any character set and in any peripheral environment, Innova said.

The user can edit output before printing to customize for specific applications, a spokesman noted.

Innova-Stak Updates

Along with the release of Innova-Sdump, Innova introduced two versions of Innova-Stak M6800: Level 1.0, optimized for the production environment, and level 1.2, augmented to extend the effectiveness of Innova-Sdump.

Together with Innova-Sdump,

the three levels of Innova-Stak M6800 provide the assembly language programmer with a set of tools for development of reentrant and address-independent code, the spokesman said.

All products are available on 49-year licenses with permission to use the products in packaged software, and all are shipped on MDOS-compatible diskettes with user manuals.

License fees are \$50 for Innova-Sdump M6800-1.1 and \$35 each for the other two. A package containing all three versions of Innova-Stak is available for \$95.

Innova Systems is at 115 East 9th St., New York, N.Y. 10003.

Super Basic for 6800s Uses Percom Minifloppies

GARLAND, Texas — A Super Basic for 6800 microcomputers that uses Percom Data Company, Inc.'s LFD-400 or LFD-1000 minifloppy disk systems has been introduced.

An extended disk Basic, Percom Super Basic supports 42 commands and 31 functions and requires 12K bytes of memory.

The Percom Super Basic is compatible with programs written in Southwest Technical Products Corp. 8K Basic. In addition to extra commands and functions, it includes refinements that reduce program runtimes by 35% to 45%, Percom claimed.

Additional Enhancements

Other enhancements include direct, random access to disk file data, optional use of the question mark instead of the PRINT command, line and character position error reporting and fast execution of function calls, according to the firm.

Super Basic is supplied on minidiskette. Together with a user manual, it costs \$49.95 from Percom at 318 Barnes, Garland, Texas 75042.

Universal Development Unit Includes 48K Bytes of RAM

LOS ANGELES — Futuredata Computer Corp. has introduced a universal microcomputer development system, the AMDS-AFD, which provides the tools needed for designing and testing 8080, 8085, 6800, 6802, or Z80 microprocessors.

The system includes the AMDS CPU with 48K bytes of static random-access memory (RAM), a universal logic analyzer, a CRT and a keyboard.

Hardware development capabilities of the AMDS-AFD system include real-time in-circuit emulation to 5 MHz; 48-channel logic analyzer with 256-state trace buffer; three hardware

break registers, loop counters and delay counters; dual double-density disk drives with a 1M-byte storage capacity; and a high-speed CRT.

The high-speed logic analyzer allows the tracing of real-time systems, Futuredata said. A software development set on diskette includes relocatable macro assembler, object program linker, screen-based editor, interactive debugger with disassembly and symbolic debugging and command control language.

The AMDS-AFD costs \$16,500 from Futuredata at 11205 S. La Cienega Blvd., Los Angeles, Calif. 90045.

Aim16 Linked to Commodore Pet

BROOKFIELD, Conn. — The DAM Systems 16-channel analog input module, the Aim16, can now be directly connected to the Commodore Business Machines, Inc. Pet microcomputer, according to

the module's vendor, Connecticut Micro Computer, Inc.

The Petmod, an analog-to-digital converter adapter module, plugs into the Pet IEEE port and Pet user port. The Petmod then has available two

Pet IEEE ports and one user port in addition to the DAM Systems port.

The Petmod is also called the Petsavr since, once it is plugged in, it can be left plugged in and the Pet owner can use the IEEE and user ports on the Petmod. This saves the fingers on the Pet's printed circuit board from becoming worn out, the vendor said.

The Petmod sells for \$49.50 from Connecticut Micro Computer at 150 Pocono Road, Brookfield, Conn. 06804.

Floppy Disk Controller Built for 6800 Micros

TUCSON, Ariz. — Users of Z80 microprocessor systems have been offered a floppy disk controller from Applied Micro Technology, Inc. (AMT).

The FD-100, which is physically and electrically compatible with the Pro-Log Corp./Mostek Corp. STD bus concept, will support up to four IBM standard format soft-sectored floppy disks in either the full 8-in. or the 5.25-in.

minifloppy size.

The software-controllable flexibility of the FD-100 allows intermixing of both types of drives, a spokesman noted.

The controller incorporates a Z80 PIO circuit and will fully support Mode 2 interrupt-structured software. I/O port selection is mini-switch selectable, the spokesman said.

The FD-100 costs \$215 from AMT at P.O. Box 3042, Tucson, Ariz. 85702.

First Training Marathon Occurs

(Continued from Page 79)
assure 24-hour supervision. Food was sent in so they wouldn't have to leave their posts.

The emptiest time was usu-

ally about 3 in the morning. Even then, however, two or three students could be seen seated at terminals.

Their parents supported the marathon, which received attention from the local media, and many went in and out to watch their children learning to use the computer.

"The whole thing worked better than I expected," Doose said. As a result of the marathon, 120 students in the seventh to 12th grades completed the TRS-80 Basic Level I training course; 45 of those students want to go on to the advanced course.

Back to One

The school is now back to one computer, with a loaner from Radio Shack being used until the store needs it. Holy Cross is trying to find funds to purchase more micros to help in remedial math and English classes.

The TRS-80 was originally chosen by the school because it is the kind of system at which a student could sit down and interact with immediately, Doose said. Right now the computer is being used only to teach students how to program.

The TRS-80 system includes the CPU with 32K of memory, an expansion interface, Level II Basic, a printer, two disk drives and a video and cassette recorder.

Radio Shack loaned Holy Cross five 16K-byte Level I TRS-80s, 14 4K-byte Level Is, three 16K-byte Level IIs, three printers, two expansion interfaces, two disk drives and 14 Level I cassette courses as well as such games as Micro Chess and programs like Algebra I, Math I and a payroll cassette program.

Another San Antonio high school is thinking of challeng-

ing Holy Cross' record. Holy Cross will probably accept the challenge.

"When the marathon was immediately over, I wasn't sure I would ever do it again, but now I think I might. When you see so much enthusiasm, it's hard to say no," Doose said.

Apple Graphics Backed

NEWPORT NEWS, Va. — The Hires Graphics Utility Set is a collection of programs designed by Soft-One to facilitate the use of Apple Computers, Inc. Apple II graphics capabilities.

The programs include a software-controlled character display, which displays lower case, APL, Russian, Japanese and mathematical notations; a character set generator and editor that allows the user to define and edit character sets or invent a language; a shape vector table assembler and editor which edits, creates, stores and displays hire solution forms with user-controlled memory location, color, shape, scale, rotation, overlay and animation projects; and a find utility, which returns current position on screen.

The five programs are on tape, come with a manual and cost \$9.95 from Soft-One, 315 Dominion Drive, Newport News, Va. 23602.

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Correction

In "Speech Synthesizer Fits TRS-80 Microcomputer" [CW, March 5], the promotional price of the Model CT-1T speech synthesizer from Computalk Consultants should have been \$495, not \$95.

Critical Materials: Should We Worry About the Supply?

By Marcia Blumenthal

CW Staff

The escalating cost of raw materials used in the manufacture of components for computer systems can be comfortably passed on the OEM or end user. But what if certain materials were not available at all or available only in very limited quantities?

Two scenarios could result. Computer makers may find themselves waiting for components, thus slowing down the delivery cycle. Or manufacturers may begin substituting other materials at the possible expense of product reliability or performance.

While talk of the unavailability of strategic

metals and minerals may seem more conjecture than reality today, increasing attention is being focused on how politics may affect the supply of strategic materials. In a recent interview, Bodhan O. Szuprowicz, president of 21st Century Research and a long-time observer of the relationship between politics and critical materials, said he expects another invasion of Shaba province in Zaire in April or May.

Shaba was invaded last May in what Szuprowicz interpreted as a concentrated effort by Marxist regimes to cut off the West's supply of cobalt.

Although the Soviets were not directly (Continued on Page 86)

Only Two to Three Years Behind U.S. Soviet Chips Seen Ahead of Reports

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Surprisingly rapid progress in the USSR's computer microcircuit development program has put that country's electronics industry only two or three years behind the U.S. That means the Soviet Union is several years ahead of what recent U.S. intelligence reports indicated, according to Control Data Corp.

CDC's analyses of 11 different microchips obtained from Soviet scientists show the Russian circuits "compare favorably" with those produced in the U.S., according to R.D. Schmidt, CDC executive vice-president.

Schmidt and four CDC executives exhibited the Soviet circuits and the company's laboratory analyses of them at a press conference here Feb. 28. The company was given the sample chips because the Soviets "see Control Data as a potential buyer of their products," according to Lynn Gallup, CDC's general manager of East-West technical strategy.

The Soviets are producing 4K and 16K Cmos technology circuits that are "the equal of anything we can produce in terms of the quality of production," Gallup stated. As recently as last October, it had generally been thought the USSR was only capable of producing 2K chips.

They also have made significant advances in emitter-coupled logic (ECL) technology, according to Gallup. There is no reason Soviet ECL circuits would not function adequately in CDC's largest supercomputer, the Cyber 203, he noted.

Until recently, Gallup said, he thought the Soviets were about five years behind the U.S. in computer technology, but now he believes they are no more than two to three years behind. Although not yet at the U.S. level, "the Soviets have a very up-and-coming components technology."

The CDC executives conceded they have not been allowed to visit Soviet factories said to be producing the advanced circuits and have no way of knowing the production yields. But Schmidt noted that CDC lab analyses found the Soviet chips to be production components, not prototypes. "My surmise is that [the Soviets] are producing one hell of a lot of these circuits," he said.

(Continued on Page 82)



CW Photo by J. Kirchner

R.D. Schmidt

Government Asks to Respond To IBM Blast of Paper Request

By Connie Winkler

CW Staff

NEW YORK — Defending its honor, the Justice Department has decided to answer IBM's vitriolic response to the government's original request for more documents in the U.S. vs. IBM antitrust case. The documents — a long list of what IBM calls trade secrets — would be used to study the question of relief, or what would happen if IBM were found to be a monopoly [CW, Feb. 26].

The Justice Department has requested from Judge David N. Edelstein permission to reply to IBM's memorandum, according to

Robert J. Staal, who heads the government team. Such a move is not standard and requires the judge's approval.

If approved by Edelstein, the government's reply will be the latest brickbat in an exchange that began with the government's motion on relief dated Jan. 17, the 10th anniversary of the filing of the case. IBM's responding memo was dated Feb. 16.

The second government memo would address both the relief issue and IBM charges in its memo, Staal said.

IBM's memo was the angriest attack the (Continued on Page 84)

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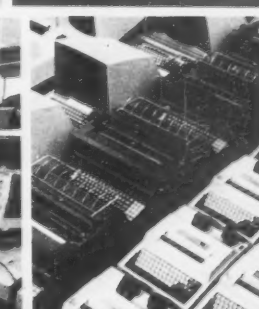
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Falco Leaving Lear Siegler to Take Infoton Reins

ANAHEIM, Calif. — Lee Falco, formerly president and founder of Lear Siegler, Inc.'s Data Products Division, has been named president of Infoton, Inc. Falco succeeds William G. Moore Jr., who was recently ousted from Infoton's top operating executive slot.

In a telephone interview shortly after he was named Infoton president, Falco said the decision to leave Lear Siegler was a difficult one to make. Describing himself as an entrepreneur, Falco said an equity position at Infoton made the offer particularly attractive.

Falco, who has been with Lear Siegler for about seven years, said he probably wouldn't have left the company if he had had an ownership interest there.

Falco considers Allen H. Parkinson, Infoton's chairman and chief executive

officer, an innovator with a "Midas touch."

"We hit it off because we are both entrepreneurs," he said. Parkinson has financial interests outside of the computer industry, including the Wax Museum in Hollywood, Calif.

Noting that Moore's firing had been widely reported in the industry press, Falco claimed he knew little of the relationship between Moore and Parkinson. He further stated he "did not know what Infoton's problems were," adding that he would provide stabilized management to the Burlington, Mass.-based terminal maker.

Falco does not anticipate making any sweeping changes at Infoton and said there are no plans to relocate the entire company to California.

Falco founded the Data Products Group at Lear Siegler in 1972. Starting with a handful of people, he built up the group, which was formally recognized as one of the 52 divisions of the

conglomerate last July.

William A. Terry, formerly sales and marketing vice-president of the Data Products Division, has been named president of the division.

Analyses Show Soviet Chips Ahead of Intelligence Data

(Continued from Page 81)

The chips were to be turned over to the U.S. Department of Defense for government analysis following the press conference, according to Schmidt. The circuit information was given to the press first "so there would be no desire on anyone's part to try to

classify it," he stated.

The press conference was called as part of an undisguised lobbying effort to relax U.S. export controls on computer equipment sold to Eastern European countries. "Nothing has really changed since 1950" in export controls, Schmidt said, but the U.S. export licensing system will be reviewed this summer.

"The simple truth," he said, is "the United States no longer has a commanding lead in computer technology." U.S. supremacy over the USSR in electronics technology is "getting thinner all the time."

Because of "well-intentioned but misguided technical evaluations," American manufacturers are not allowed to export computers that the Soviets can now either produce themselves or obtain from Japanese sources, according to Schmidt.

U.S. computer makers are presently restrained from exporting to Communist countries machines with a process data rate (PDR) greater than 32 million bit/sec. Schmidt said he agrees with a Computer and Business Equipment Manufacturers Association panel that recommended the level be raised to a PDR of 75 million bit/sec. That would allow export of machines such as the CDC Cyber 174 and the IBM 3031, the CDC representatives said.

Market Potential

Noting that at the end of 1976 the USSR was estimated to have only 10% of the computers installed in the world, Schmidt said there is a tremendous market potential for U.S. manufacturers in the USSR. He estimated an export license PDR ceiling of 75 million could mean as much as \$500 million in sales for CDC over the next five years, or 10% to 20% of the total Soviet market for U.S. computers.

According to Gallup, the Soviets probably have the capability to build the large computers they need for military and priority research and development applications. But they are not yet capable of mass producing computer systems for everyday use, which leaves a large market the U.S. should exploit, he reasoned.

By any measure, there is an enormous demand for western computers in the East," Gallup maintained. Schmidt added that through control of spare parts, U.S. manufacturers can easily protect against Soviet application of U.S. computers to military uses.

Our overly-protective export controls are outdated," Schmidt said. They have not kept the Soviets from developing an indigenous electronics manufacturing capability that is fast approaching the sophistication of U.S. industry.

But they are making the USSR a competitor of the U.S. in the international computer marketplace, he warned.

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DEC-Type Mini Set This Week?

SAN FRANCISCO — The formal introduction of a National Semiconductor Corp.'s minicomputer that is plug compatible with Digital Equipment Corp.'s PDP-11 could occur as early as this week, a company spokesman said.

Another spokesman, who said the product announcement — including pricing — is complete, could not confirm the exact timing of the Series 200 introduction.

The announcement was originally set for mid-January, but was delayed when IBM introduced the 4300 series. Because of the ramifications of that announcement on National Semi's activities, its Computer Products Division has been concentrating on assessing the impact of the IBM line, the spokesman explained.

The delay in the introduction of the Series 200 has nothing to do with the court case National Semi brought against DEC pertaining to patent infringement issues, the spokesman said. That case was filed to clear the way for the introduction of the DEC compatible mini [CW, Oct. 9].

A federal court judge here recently granted DEC's motion to transfer the case from California to New Hampshire.

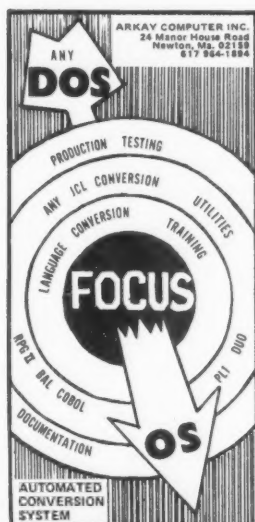
DEC Going Ahead With Plant in Maine

MAYNARD, Mass. — Digital Equipment Corp. will proceed with the construction of a production facility in Augusta, Maine, the firm reported.

DEC intended to begin construction of the plant in December 1976, but opted to lease a smaller plant in Augusta until economic conditions were more favorable, a spokesman said.

In February 1978, the company postponed the expansion indefinitely. It said then that the leased plant, which employs 325 people, was adequate for its needs.

The 300,000 square-foot plant which is expected to be completed by late 1980 will produce subassemblies and digital options. The labor force at the plant could reach 1,000 within a few years, creating about 700 jobs for area residents.



AM Gets Contract From SBS

WASHINGTON, D.C. — Satellite Business Systems (SBS) has awarded AM International, Inc. a contract to develop a computerized high-speed facsimile system.

The AM system, which is expected to be ready in 12 to 15 months, is for demonstration purposes only. "SBS can only offer the satellite transmission service and not the hardware, so our system will be used to demonstrate the service they will offer to users," according to Alan Easton, AM's vice-president of communications.

After reviewing about 60 proposals, SBS chose AM because "it is a technically and financially qualified company, having the appropriate interest to make the equipment

readily available for the marketplace," an SBS spokesman said.

Part of Strategy

Although buoyed by the SBS contract, which is valued at less than \$1 million, AM said the development of intelligent copier technology is part of the company's long-range strategy. The link with a satellite is one of many applications for the proposed system, Easton said.

However, the equipment used to demonstrate the system will probably have an edge in the satellite communications marketplace, he admitted.

AM said the technological capability to develop a facsimile system that is 120 times faster than most

current machines will be gained from the use of computers and advanced laser-scanning techniques. AM's contract calls for the delivery of two systems.

SBS envisions using the system as an electronic intracompany mail delivery system capable of sending up to 3,000 high-quality copies by satellite to distant cities.

Because it cannot sell hardware for its satellite service, SBS wants to act as a catalyst in stimulating vendors within the computer industry to develop the hardware necessary to deliver the service. To this end, SBS said it has held several conferences with equipment manufacturers to advise them of potential customers' hardware requirements.

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In addition, the report will include some tips on saving money — how to ingest more data for your dollar — and some new ideas on updating old data entry systems.

All-in-all, it should be very interesting reading if you have anything to do with gathering data. And if you're marketing a product or service in this field, this special report is a very good place to spread the word with your ad. Call your *Computerworld* sales representative, or Terry Williams at (617) 965-5800. Ad close is April 6th.



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Renegotiation Board Pleads for Longer Life

By Jake Kirchner

CW Washington Bureau
WASHINGTON, D.C. — The moribund Renegotiation Board last week put up a spirited fight for new life, but several members of Congress made it quite clear it will take a minor miracle to save the board, scheduled to go out of business at the end of this month.

"You folks are on borrowed time unless something radical happens," Sen. Ernest F. Hollings (D-S.C.) told board members at a Senate Appropriations hearing recently. "I don't believe the law [mandating termination of the board] is going to be changed."

Statutory authority for the board ended in 1976. Since then the board has been work-

ing on its backlog of cases.

The Renegotiation Board was established in 1943 to review certain government contracts and assure that excess profits were not being made by vendors selling to the public sector. It has been revitalized by legislation 13 times since its founding.

The recent hearings were on the subject of funds requested in President Carter's budget to allow the board to continue through fiscal year 1980. Rep. Joseph Minish (D-N.J.) has introduced legislation that would extend the board's life for another three years.

Acting Renegotiation Board

Chairman Harry R. Van Cleave said that no matter how good federal contracting procedures are, there is still the possibility of excessive profits in government contracts.

About half of all Defense Department procurements are done on a sole-source, non-competitive basis, he claimed.

And the board is not without its advocates. At the hearing before the Senate Subcommittee on State, Justice, Commerce and the Judiciary, Sen. William Proxmire (D-Wis.) delivered an impassioned plea for a stay of execution.

Closing down the board would be "a major breach of

faith with the American people," Proxmire said.

Against Extention

The weight of congressional opinion, however, was clearly not with Proxmire. Senators Alan Cranston (D-Calif.) Charles McC. Mathias Jr. (R-Md.) and Jake Garn (R-Utah) and Representatives Paul N. McCloskey Jr. (R-Calif.) and Norman Y. Mineta (D-Calif.) all spoke out strongly against any extension of the board's operations.

Cranston told the subcommittee he feels the board is "cumbersome, duplicative and wasteful" and "has outlived its purpose."

Government Asks to Respond

(Continued from Page 81)

company has made on the government's actions in this trial to date. The memo and accompanying affidavits charged the government lawyers with everything from failing to read the record and the law to statements "nothing short of mendacious."

The text was peppered with a string of harsh adjectives including "reprehensible" and "ludicrous."

"If granted, the government's motion would require the review of more than 350 million pages of documents located in more than 100 installations around the world; the production of several million pages of the most proprietary and confidential documents in the company's possession and an aggregate effort of more than 2,000 man years," the IBM memo said.

IBM placed the story of its memo with *The New York Times* and *The Washington Post* the day it was available to the public.

While the memorandum presents the legal points why Edelstein should not grant the government motion, the best reading is Thomas D. Barr's 45-page attached affidavit. A member of the Cravath, Swaine & Moore law firm, Barr is IBM's field marshal on the case and his statements — in graphic and colorful language — blasted the government.

The government's request for information from IBM is a "dragnet document demand of unconscionable breadth," Barr said. "Not only is the motion without merit, if granted it would bring the case to a complete halt, which would last the lifetime of all now involved."

IBM's response package includes a 20-page memorandum on legal points for rejecting the government motion. Barr's 45-page affidavit lashed out at the government lawyer's "Ignorance of the record" and affidavits by two

IBM employees spelled out the difficulty of complying with the government request.

The information requested "would be a burden far greater than any which has previously been imposed on IBM in this or any of the other litigations with which I am familiar" said one of the two employees in an affidavit.

"This scheme would be reprehensible enough were there even an arguable predicate for the motion," the IBM memo said. "But, in fact, it proceeds from premises so demonstrably false one can only wonder at the temerity of irresponsibility with which they were uttered."

Attacks on the government attorneys charge they did not know the record of the trial and "it is hard to believe that any responsible lawyer on plaintiff's staff read these cases before citing them."

Barr's affidavit talked fur-

ther about the trade secret confidentiality problem of the documents the government has requested. If the government demands are granted, the trial will come to a "crashing halt."

Further, the document demand comes on top of the government's most recent subpoena of IBM Chairman Frank T. Cary, which likewise requests numerous documents.

About the Cary subpoena, Barr said, "Virtually every document in the company's possession written since 1974 [relates] to the DP business — literally more than 4.5 billion pages of documents."

IBM also discounted the protection the government said it would give to the IBM business secrets by going through the list of persons on the government's proposed relief task force.

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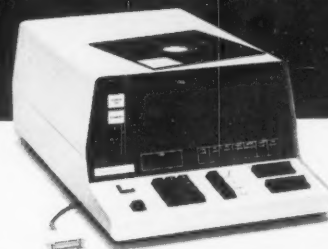
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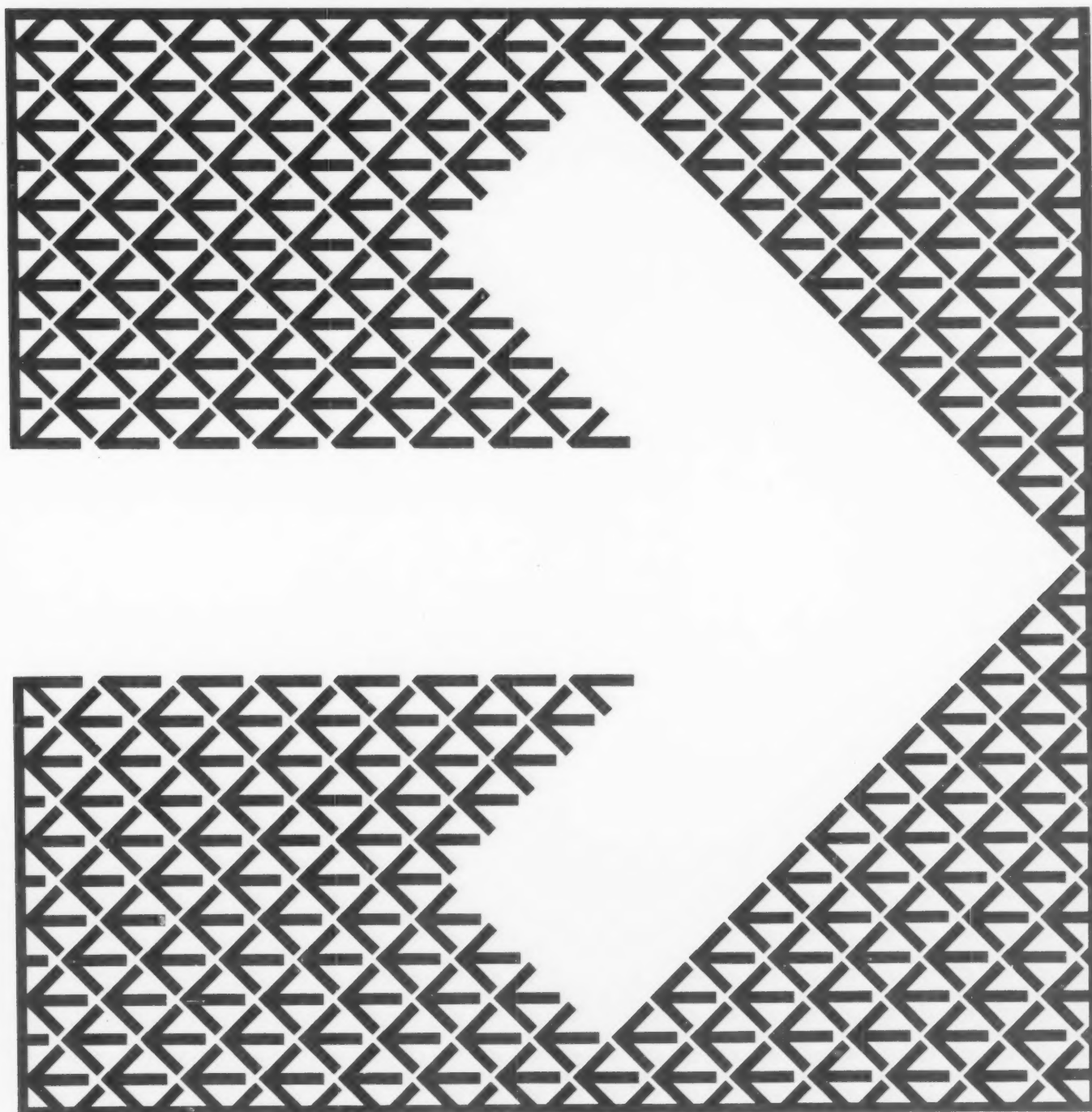
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BECAUSE MANAGING DATA MEANS MANAGING CHANGE

Computer Corporation of America

First-Quarter Net Rises 40% At Annual Meeting, HP Accents New Product

By Molly Upton

Special to CW

SANTA CLARA, Calif. — Last year Hewlett-Packard Co. introduced a "major new product twice a week, with smaller ones thrown in to even out the flow," John A. Young, the company's president, told shareholders at the recent annual meeting here.

In addition to highlighting operating results for the past year, Young emphasized the importance of product development at HP, noting that "two-thirds of HP's sales dollars were derived from products developed within the past five years."

Pointing to the HP 3000 on display at the meeting, Young said, "That

innocent-looking thing represents an investment of several million." With a six-year development cycle, it is HP's most expensive research and development effort.

Young told stockholders that the firm ranks among the top five firms of the Fortune 500 in terms of R&D investment as a percentage of sales, with 9% of the firm's revenues having been invested in R&D last year.

The meeting seemed to mark the transition in management from HP's founders, David Packard and William R. Hewlett, to Young. Although Packard opened and closed the meeting, Young disclosed the bulk of the infor-

mation to shareholders.

Other concerns of the company are the expansion of lead times and the shortage of trained technical personnel.

Last year HP hired 1,600 technical people, 700 of whom were recent college graduates. This year the company hopes to attract 2,300 professionals, with 1,500 coming from colleges.

Raw Goods: Need to Worry?

(Continued from Page 81)

involved in the disruptions in Shaba, Szuprowicz said he is beginning to believe they were behind the disturbances and have "a strategic plan to more or less, one by one, subvert those countries that produce critical materials."

"The Soviet press seems to be ob-

sessed with the Western market for critical materials," he noted.

The U.S. imports 98% of its cobalt, with most of it coming from Zaire. The Soviet Union itself has a major indigenous supply of cobalt.

Cobalt is a magnetic metal used in motors. A typical computer installation may have 30 highly tuned motors which are built using cobalt, Szuprowicz said. Aside from the recent cost escalation of these motors, their availability may be in question if another invasion takes place, he observed.

After the last disruption of the copper mines in Shaba (cobalt is a derivative of copper), some cobalt distributors rationed cobalt to buyers at 70% of the amount they purchased prior to the invasion.

The U.S. now imports more than 50% of 20 critical materials. Among those metals and minerals, 15 are produced almost entirely by four or five south African nations, Szuprowicz said.

Other critical metals are platinum derivatives, which are also produced in the Soviet Union and South Africa. The Soviets recently withdrew platinum from the market in order to mint souvenirs for the 1980 Olympics, according to Szuprowicz.

What Szuprowicz foresees is a "super cartel" of mineral-producing nations, much like the Organization of Petroleum Exporting Countries (Opec). This cartel could disrupt the supply of critical materials at will creating production delays in many industries, including the computer industry.

Some western European nations have already begun examining their policies on stockpiling strategic materials.

France's current strategic materials stockpile is believed to be valued at more than \$70 million. The French government has reportedly committed \$12 million annually to build its stockpile over the five years beginning in 1980.

The U.S. currently stockpiles about 90 different materials, Szuprowicz said, adding that the actual purchase price of the U.S.'s current stockpile exceeds \$8 billion.

Congress has authorized the Department of Defense (DOD) to stockpile a three-year supply of critical material in case of war, he said. The U.S. currently has no stockpile of any consequence of major magnetic materials, such as cobalt, he added.

While Szuprowicz's observations are frightening, to date there does not appear to be any serious problem in obtaining critical materials. However, many manufacturers and distributors interviewed by *Computerworld* over the past month said they are experiencing delays in getting components.

A spokesman for Engelhard Industries, a major refiner of precious metals, said that while the prices of oil for refining metals have risen sharply, the company has not had a difficult time obtaining raw materials.



Photo courtesy of Universal Pictures.

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CalComp mini-peripherals: Because who knows what evil lurks?

GA Lays Off 100 in 'Overhead Cleanup'

ANAHEIM, Calif. — As part of an "overhead cleanup" that will save about \$2 million in expenses, General Automation, Inc. recently laid off more than 100 employees.

In an interview explaining the layoffs, Lawrence A. Goshorn, GA's president and chairman, squelched rumors

that the layoffs included marketing and manufacturing personnel. "Overhead had built up faster than shipping levels," he contended.

Discussing the company's lower than expected operating income for its second quarter, Goshorn said the poor showing was primarily a result of a delay in planned shipments created by various parts shortages. "What is generally happening is that vendors within the industry are reluctant to crank up capacity because of the fear of a recession, when in reality the industry is growing," Goshorn observed.

Delivery times for parts are now 30% to 40% longer than a year ago, he added, citing components and printed circuit boards as products with especially long delivery times.

Shipping problems at GA have been further exacerbated by the company's marketing of total systems. "We have to manage more materials in smaller volumes, so we are subject to a variety of shortages and delays," Goshorn said.

However, in making the layoffs, Goshorn claimed, the company took into account the number of employees it would need to meet shipment goals produced by record bookings.

Second-Quarter Postings

Second-quarter bookings reached a record \$33 million. The backlog at the end of the second quarter totaled \$47.8 million.

Revenues for the second quarter were \$26 million compared with revenues of

\$22.1 million in the year-ago period. Quarter earnings rose to \$714,000 or 27 cents per share compared with \$687,000 or 27 cents per share in the corresponding quarter last year.

However, second-quarter results include a tax-loss carryforward of \$382,000 compared with the \$15,000 carryforward in the same 1978 quarter.

For its first six months, GA reported revenues of \$53.2 million, up from the \$41.1 million in the 1978 half-year. Net income was \$1.7 million or 66 cents per share compared with 1978 six-month earnings of \$849,000 or 34 cents per share.

However, extraordinary credits for the half were \$540,000 as opposed to the \$55,000 credit taken in the same period a year ago.

STC Net Rises 135% for 1978

LOUISVILLE, Colo. — Storage Technology Corp. (STC) reported a 135% increase in earnings and an 85% increase in revenues during 1978.

The firm's board of directors also authorized a two-for-one split of its common stock, which will be effected as a 100% stock dividend. It is expected the additional shares will be distributed May 15.

For its latest fiscal year ended Dec. 29, STC had total revenues of \$300.4 million compared with 1977 revenues of \$162.2 million. Earnings jumped to \$26.8 million or \$2.27 a share from \$11.4 million or \$1.08 a share in 1977.

In commenting on the company's financial performance, STC President Jesse I. Aweida said that "products in place or in the manufacturing cycle will ensure continued strong growth during 1979 and 1980... we have several new products under development that will continue this accelerated growth well into the 1980s."

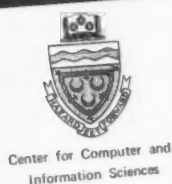
Contracts

Intermetrics, Inc. has been awarded a contract from the Air Force Space and Missile Systems Organization for independent verification and validation of the Global Positioning System Phase II user equipment. The four-year contract is valued at \$4.4 million.

Datatrol, Inc. has won a 26-month contract from the Michigan Bureau of State Lottery to expand and operate the system. Datatrol's revenues for the term of the contract are expected to exceed \$11 million.

ITT Worldwide has signed a three-year contract with Kennedy Co. that calls for magnetic tape transports to be used in ITT's computerized telephone exchanges. The contract is valued at \$1.5 million.

Scientific-Atlanta, Inc. has received a contract from Empresa Brasileira de Telecomunicacoes for ground communications equipment to be used in the Brazilian domestic satellite communications program. The contract is valued at more than \$750,000.



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Mr. John R. Hillegass
Executive Editor
DATAPRO Research Corporation
1805 Underwood Boulevard
Delran, New Jersey 08075

Dear Mr. Hillegass:

At Seton Hall University, we just completed a request for proposal, selection, and evaluation and order for a new computer system.

The purpose of this letter is to commend you and your technical staff for the information that is provided in our subscription to the DATAPRO EDP Buyer's Bible. These volumes provided us with not only accurate and timely information concerning the vendors computer systems, but also saved our staff thousands of dollars of research time, and also, provided information allowing us to reconfigure the vendors proposed configuration to meet our specifications at the best cost performance ratio. By doing so, we were able to save hundreds of thousands of dollars over the installed life of the system.

Please accept this letter of thanks from a very satisfied subscriber and customer.

Sincerely,

George J. Germann

George J. Germann
Director, The Center for Computer and Information Sciences.

GJG:rbc

What more can we say?

We think Mr. Germann's unsolicited words make the point better than any we could choose. We'll strive to continue to deserve his, and your, trust in Datapro. Thank you, Mr. Germann.

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Knowledge of applications and operating systems software helpful. Good communications skills and a minimum of 5 years experience required.

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These positions require an extensive knowledge of relevant technical areas. Also required are a PhD in computer science or equivalent and related practical experience.

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Conducting research in the area of software modularity, your initial focus will be on the use of software modules to construct software systems in a lab environment. Other problems to be addressed include module specification methods, interconnection and coordination of modules, and the design of tools to enable users to build systems with software modules.

Required are a PhD or equivalent in computer science and a strong background and interest in software engineering.

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You will investigate, design, and implement a prototype natural language interface to data base systems. Our goal is to produce a data base system that can be used effectively by professionals who have little or no knowledge of programming.

This position requires a PhD or equivalent in computer science, familiarity with current natural language systems and a knowledge of data base concepts.

Security And Protection Research

Your research and consulting will focus on the use of security kernel structures and formal verification techniques in the implementation of secure systems. You will advise on the potential for modifying or re-implementing current products as well as guiding the development of new ones. You will also act as security/protection consultant to development and product line groups.

You must have a PhD in computer science or equivalent. Experience in the design of kernelized secure operating systems, in formal verification methods, or in security models is also required.

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Your principal responsibilities will be to apply known techniques for data compression to practical problems, and to introduce this technology to various areas of the company. Working from the Research & Development group, you will serve as a consultant, do prototype implementation, and look for opportunities to exploit data compression in both our products and our internal operations.

You must have a knowledge of both the underlying theory and practical applications of data compression. Your experience should include substantial programming and computer use. Additional depth and breadth of computing knowledge would be an asset. Your long term potential as a productive member of a research group is also an important factor.

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You will be doing research in Distributed Systems Architecture. This position requires a researcher with a strong end-user orientation. You will be part of a team working on the design of distributed processing tools for DECnet systems. The major thrust is in the area of transaction processing within a distributed environment. Specific work will be in one of several areas including: system architecture, software fault tolerance, performance measurement, or distributed data base structuring.

You should have a PhD or equivalent in computer science, and experience in systems implementation in one or more of the areas listed above.

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This position calls for an imaginative researcher who is interested in the design, implementation, and use of distributed operating systems. Your interests should be in operating systems or in programming language/operating system interaction. You will be part of a research team exploring a distributed capability architecture, and work on design and implementation issues or on problems of matching programming languages to such architectures.

You should have a PhD in computer science and experience in distributed operating system design and/or capability architectures.

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- architecture of data base systems
- performance
- distributed DBMS
- integrity

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knowledge of the field of computer aided instruction. Strong practical experience in computing and experience as an educator would also be highly desirable. In addition, you should be adept at detailed project planning, technical design, and at being a key implementor and technical leader of a small project team.

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This is a project leader position that involves responsibility for the development of applications involving graphics input and output within the office environment. These applications will provide capabilities similar to those provided by facsimile networks and intelligent copiers as part of a distributed office information system.

An advanced degree in computer science or electrical engineering, or the equivalent, and several years directly applicable experience are required. A demonstrated ability in software development is also necessary. Experience with any of the following would be a plus: office procedures, office applications software, graphics terminals and facsimile equipment, and communications.

Prototype System Integration

This person will take hardware and software components from other projects within the

program and integrate them into a prototype system. This will involve working closely with other project personnel to insure that the components will fit together and meet the overall architectural specifications. The prototype system will be developed as a series of base levels with the previous base level being used on a daily basis by the program team.

A PhD in computer science or electrical engineering, or the equivalent, and 5 years directly applicable experience are required. A knowledge of both hardware and software is needed, including demonstrated competence in programming and system engineering.

Word Processing Integration

This person will be responsible for incorporating word processing into our prototype office information system. This will involve working with our word processing product line to insure compatibility with current and future products in this area. This is an applications software development position located in Merrimack, New Hampshire.

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If you are interested and qualified in any of the above positions, please forward your resume, including salary history to John DiPietro, Digital Equipment Corporation, Dept. A312 3807, 146 Main Street, Maynard, Massachusetts 01754. We are an equal opportunity employer m/f.

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LANGUAGE DEVELOPERS with experience developing high-order languages.

ASSEMBLY LANGUAGE PROGRAMMERS with knowledge of Data General assembly language, experience on NOVA equipment and knowledge of RDOS or RTOS operating systems.

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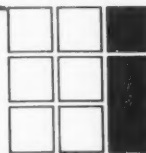
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You will be the performance specialist on an architecture team responsible for detailed evaluation of alternative architectures and designs. You are a qualified professional in computer system performance measurement, evaluation and modeling with emphasis on architecture or design. Research into key areas of new product development will be a major responsibility.

PERFORMANCE MEASUREMENT SPECIALIST

You will be responsible for developing measurement methodologies and providing measurement inputs to the architecture and design process in support of future product development. Knowledge of the operation of hardware and software monitors, computer system operation and interest in hardware and software architecture are required.

WORKLOAD SPECIALIST

You will be responsible for research of computer system workload classification and analysis, including creation and synthesis. MVS, IMS or related systems experience is necessary and TPNS experience is desirable.

We're looking for exceptional talent. You can expect an exceptional compensation and benefits package. Please indicate 492-E on your response and direct it to Employment Department, Amdahl Corporation, P.O. Box 5070, Sunnyvale, CA 94086. We are an equal opportunity employer.

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BUSINESS SYSTEM ANALYST

Duties include feasibility studies, definition of user requirements, development of programming specifications, documentation of system and procedures, and responsibility for guiding systems development and implementation activities. Undergraduate Degree: Masters preferred. Good oral and written communication skills and a sound technical data processing background are essential. Three to five years direct experience with accounting applications on IBM 360/370 and/or Burroughs B3500 Computer Systems required.

COMPUTER PROGRAMMER

Duties include the implementation of new systems from the design phase through coding, testing, and documentation as well as maintenance of existing systems. Two to three years of direct COBOL programming experience on Burroughs B3500 or equivalent. Familiarity with standard business systems and ability to work with user department is required. Degree preferred.

We offer attractive benefits including reduced rate air travel, paid vacation, hospitalization, sick leave and life insurance at nominal cost. Contact D.K. Mosby at (305) 494-7322 weekdays, or send resume to Mr. Mosby, Ref. 79-87, Pan American World Airways, Inc. Aerospace Services Division, Bldg. 423, Box 4608, Patrick Air Force Base, Florida 32925. An equal opportunity employer M/F.



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Our Advanced Computer Development Group is looking for a top-notch Systems Programmer to assist with major development activities in support of

Wang's new 32-bit Virtual Memory Computer Systems. Job responsibilities include analysis, design, implementation, maintenance, and documentation of systems software components such as the operating system, compilers, system utility programs, data base management, and networking management.

This position offers excellent professional growth and advancement opportunities. Necessary qualifications include good analytical and communication skills, with system programming experience or a degree in Computer Science.

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Our Advanced Computer Development Group is looking for a top-notch systems analyst with good analytical and communication skills to assist in the complex task of integrating current development activity with defined product goals and existing proven software structures. Working on Wang's new 32-bit Virtual Memory Computer Systems, this position offers an extraordinary opportunity for involvement in many facets of the software development for a major manufacturer's general purpose computing system.

If you really want to be effective in contributing to state-of-the-art computer systems development, this is the place. Necessary qualifications include system programming experience, good communication skills, and a record of professional excellence.

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You have a good background in digital circuit design, preferably with some hands-on experience in designing computers for general purpose non-numeric computation. You have a basic understanding of systems software such as operating systems, compilers, or data base management systems and are interested in solving hardware/software tradeoffs. You have strong programming and microprogramming experience and are familiar with the leading microprocessors and their applications. If you have a background in systems design, networking, distributed processing, and especially peripheral interfacing, we want to talk with you.

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- Systems Support
- Problem Determination/Troubleshooting
- Maintenance and Modifications
- Load Balancing
- General Account Management

Your technical experience includes the ability to read dumps and write code to resolve system problems. Options for future hardware cross-training are available. We currently have immediate opportunities in the following areas:

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Orange County, CA	Cincinnati, OH	Hartford, CT
Phoenix, AZ	Cleveland, OH	New York, NY
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You will install and maintain IBM 370/145 DOS/VS, CICS/VS, POWER/VS, DMS and DL1. Must possess previous installation and maintenance experience. A manufacturing systems environment background would be helpful.

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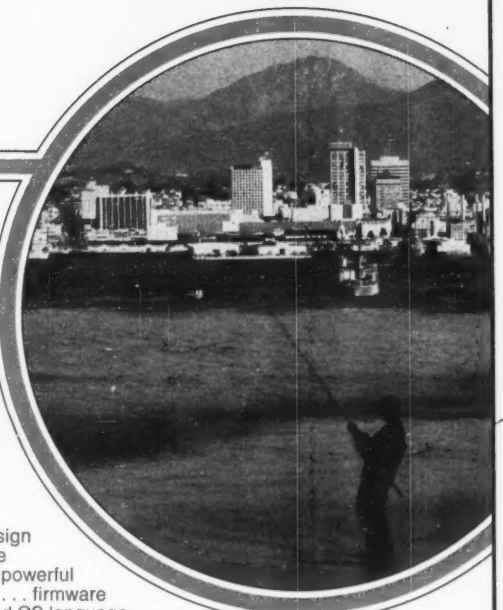
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Mr. George Rice, Manager, Professional Placement, Engineering and Manufacturing, Dept. N75, NCR Corporation, 16550 W. Bernardo Drive, San Diego, California 92127.

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K.E. Beaudet
Control Data Corporation
215 Moffett Park Drive
Sunnyvale, CA 94086



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The Information Systems Development Division for a group of hospitals located throughout the Eastern United States has immediate openings for several qualified individuals at our headquarters office located on the outskirts of Baltimore, Maryland.

We are seeking individuals at several levels of experience from programmer through Senior Systems Analyst. Successful candidates for these positions will have the desire to work in the development of large transportable on-line systems for our hospitals, and to participate in projects from initial conception through development, installation, and post installation assistance. Applicants should have the ability to communicate effectively with user personnel and to work well with minimum supervision.

The following list outlines the current hardware and software supported by our staff, and experience in several of these areas is essential: IBM/370, DOS/VS, POWER, COBOL, ALC, RPG, PL/I, VSAM, DL/I, SPW. We currently have IBM Series/E (43XX) equipment on order.

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We offer a challenging environment with opportunity for advancement limited only by your ability and willingness to excel. Company benefits are excellent and a professional working atmosphere is provided.

DIRECTOR
EASTERN COOPERATIVE SERVICES ASSOC.
INFORMATION SYSTEMS DIVISION
900 S. CATON AVENUE
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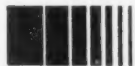
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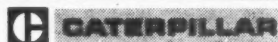
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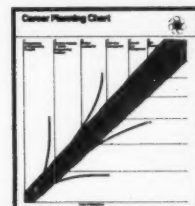
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Applicants should have an MS or PhD in computer science or equivalent experience in systems software development. For immediate consideration, please send your resume to Joyce Cordi, Intel Corporation, P.O. Box 3078, Dept. 11AC, Santa Clara, CA 95051. An equal opportunity employer m/f/h.

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A major international electronics company is seeking a senior level software professional to join in the development of state-of-the-art computer peripherals. Technical responsibilities will include interface definition, architectural design, programming, and some operating systems development. In addition, customer contact and occasional travel complement the technical aspects of this position. The ideal candidate will have 5-9 years experience with mini-computer systems and peripheral software coupled with microcomputer program development, particularly in terminal or display peripherals.

This position is based in the New England Area. We offer a competitive starting salary and an excellent benefits package. All interested candidates should mail resume (including salary history) to:

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the "Un-hardware" Company

MODULAR ONLINE SYSTEMS, COMPANY (MODLINE) is an organization of dedicated computer programming professionals successfully pursuing projects covering the entire spectrum of computer technology: micro-processors, mini-computers, communications processors, business systems, data base applications, and time sharing.

We are presently seeking experienced career oriented

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Be a PROFESSIONAL in your chosen field. Join one of the fastest growing computer software corporations.

Please reply with resume including desired salary requirements to: MODLINE, 3836 N. Ballast, Portland, OR 97217.

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A position exists assisting in the development of computer operating system software for a large-scale, multi-mainframe scientific computer center. Design and implement local modifications to the NOS operating system to enhance its effectiveness for users and operators. Develop special utility programs.

Must be knowledgeable in the internals of CDC operating systems, and experienced with COMPASS assembly language (both CPU and PP). Knowledge of FORTRAN, BASIC, or COBOL a plus.

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National Sharedata Corporation, a recognized leader in bank data processing, has an immediate opportunity for an experienced Programmer/Analyst in our Ventura center.

The successful candidate will have at least 2 years' assembler language experience; exposure to IBM/360 and/or 370 computers required. Banking application experience preferred.

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Send resume with current salary in strictest confidence to:

Dave Rich, Center Manager
National Sharedata Corporation
P. O. Box 5281 • Ventura, CA 93003
Or call collect (805) 644-8283

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(609) 771-6900

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The Vancouver/Clark County Consolidated Computer Center is installing an IBM 3031 and actively seeking a full-time Systems Programmer. Position requires experience with the installation and maintenance of DOS/V5, CICS, PL/I, COBOL, and RPGII. Additional experience with OS/V51 and VM/370 is considered a plus. Requires a minimum of two years' experience as a systems programmer. Salary commensurate with experience. Send resume, including salary requirements, by March 30, 1979, to Keith Smith, Systems and Programming Manager, PO Box 1995, Vancouver, WA 98663. EOE

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Our client, the Fla. headquarters of a major Financial Institution, is actively seeking an individual with a minimum of 2 years BAAL exp., some OS/COBOL, CICS experience a strong plus. Duties and responsibilities include: maintenance, programming, and development. This company offers an excellent opportunity for personal and professional growth. Exceptional benefits including: Maj. Med., Retirement program, Stock participation, reduced rates on Credit Cards & Loans. For immediate attention and results contact George Andrews, Division Mgr., at Hayden-Mitchell Associates, EDP Division, 2626 W. Oakland Park Blvd., Suite 213, Ft. Lauderdale, Fla., 33311, (305) 735-1015. Service Charge assumed by Client Company.

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SYSOREX INTERNATIONAL INC., a rapidly growing Systems Management Company, now developing innovative multitechnology systems in Saudi Arabia, seeks experienced Data Processing Professionals for the following positions:

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You should have at least 5 years experience in analysis and design of business TP applications. Must be knowledgeable in COBOL and IBM TP systems, preferably CICS and 3270 Terminals. Should be capable of leading large projects.

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You will be involved in applications design and programming in a TP environment on IBM 370 OS Systems. Positions require minimum 4 years experience, fluency in COBOL and Assembler, and knowledge of IBM CICS and 3270 Terminals.

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Minimum 3 years experience in applications programming on IBM TP systems. Must be fluent in COBOL. Knowledge of CICS, ALC, 3270 terminals desirable. Degree essential.

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You will be responsible for training Arabian personnel in computer operations. Must be completely familiar with IBM computer operations and possess instructor skills.

SYSOREX offers salaries commensurate with experience and a comprehensive benefits program which includes 30 day annual vacations with paid round trip transportation for employee & family to place of residence, 15 paid Holidays, free furnished family housing and free education of children.

Please send resume, including salary history, to Director of Personnel, SYSOREX INTERNATIONAL INC., 10590 N. Tantau Ave., Cupertino, CA 95014.

SYSOREX

Sysorex International Inc.



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Data Base Analyst, IMS	to 25K
EDP Auditor, Major Svc. Co.	to 24K
Programmers, Programmer/Analysts	
IBM Systems, large	to 30K
Senior Maintenance, COBOL, Mfg.	to 29K
Applications, COBOL	to 28K
Assembler, Large Svc. Co.	to 25K
Univac, Engineering	to 25K
Team Leader, COBOL, Svc. Co.	to 24K
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CICS, Distribution	to 22K
Junior, Applications, COBOL	to 17K

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If you are looking for a career path in Data Processing, please submit resume and salary requirements to:

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Applications will be accepted until March 30, 1979.

Contact Verion Olson
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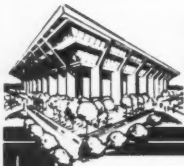
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The minimum qualifications are two years of work experience as a programmer/analyst; experience should be on a large scale computer system, IBM 370 preferred. Cobol, Fortran and Assembler desired.

Salary based on experience and education. The State of Wyoming also provides many fringe benefits.

Interested persons are invited to reply. Please send a complete resume outlining both work and educational experience. TO: Data Services Division, 2001 Capitol Avenue, Emerson Building, Cheyenne, Wyoming 82002, Attention: Monty Crofts
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Systems Analyst(s) CICS MFG/Financial	\$24K
Programmer/Analyst(s) IMS/VS	\$24K
Programmer/Analyst(s) COBOL/ALC	\$22K
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TECHNICAL SUPPORT	TO
Sr. Systems Prog(s) MVS-SYSGEN	\$30K
Systems Prog(s) OS-SVS-MVT SYSGEN	\$26K
Systems Prog(s) OS/DOS: ALC,CICS	\$18-24K



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At Fairchild, we believe the better you know us, the more likely you are to choose us. So contact directly: Elaine Andrews, Group Employment Manager, Fairchild Test Systems Group, 1725 Technology Drive, San Jose, CA 95110, (408) 998-0123 extension 365. Or Jim Boyer, Division IR Manager, Xicom Systems, 20450 Plummer Street, Chatsworth, CA 91311, (213) 885-1050 extension 266. And get some inside information on starting a career with the company that started it all.

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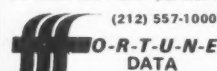
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Programmers

Systems Programmers

SRI INTERNATIONAL, a Menlo Park, CA. based multidisciplinary Research Institute has openings in its Computer Resources Department for Systems Programmers to maintain and develop systems software on several different large computers. We are seeking additional Systems Staff for CDC-6400 KRONOS, BURROUGHS B-6700, DEC KL1090T and TOPS-20, PDP-11/45 UNIX, and PRIME 400 computer systems.

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We are also looking for experienced Operations personnel for computers and peripheral equipment, with immediate openings on the CDC 400 system and a HONEYWELL PAGE PRINTING SYSTEM.

SRI is a problem solving Research Institute performing basic and applied research under contract for clients in business, industry and government on a worldwide basis.

Please send resume with salary history, in confidence, to Ken U. Hopkins, Sr. Personnel Representative, SRI INTERNATIONAL, 333 Ravenswood Ave., Menlo Park, CA 94025. (415) 326-6200, Ext. 4875. An equal opportunity employer.



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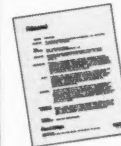
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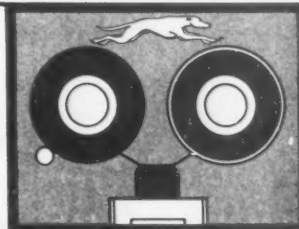


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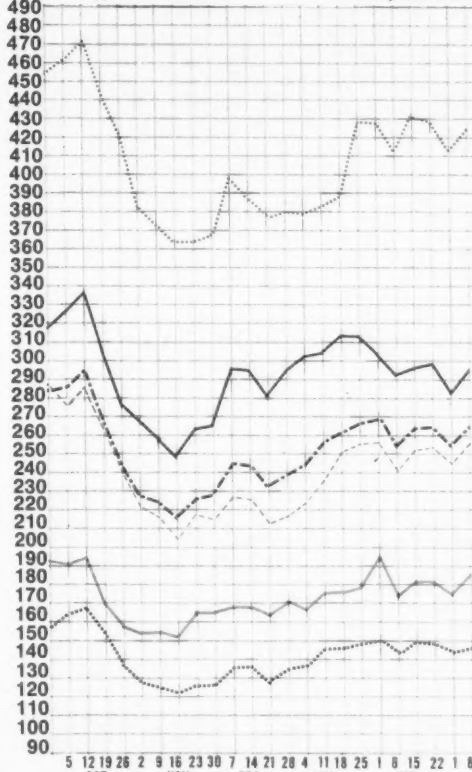
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FOR SALE SYSTEM/32 Model C44 32k Main Storage 13.7 M Disc 286 LPM Printer-48 Char. with 3742-001 Dual Data Entry Station Under Continuous IBM Maintenance Available April 1979 Call Kenneth C. Janusz Universal Scientific Corp. (812) 882-2970	FOR SALE SYSTEM/32 Model C44 32k Main Storage 13.7 M Disc 286 LPM Printer-48 Char. with 3742-001 Dual Data Entry Station Under Continuous IBM Maintenance Available April 1979 Call Kenneth C. Janusz Universal Scientific Corp. (812) 882-2970	Urgently Need SYSTEM/34's • Delivery Positions • Rental Credits • Customer Owned HIGHEST FEES PAID data3 computer corporation Contact Gene May TOLL FREE 800-328-3537 (612) 682-4884 From Mpls. 475-3720	TIME RSTS/E PDP 11/70 services available in Phila., Pa. and in Ft. Lauderdale, Fl. areas. Monthly or hourly rates. SOFTWARE: • General Ledger • Accounts Payable • Financial Report • Mailing Lists • Credit Union and Cable TV Systems • Plus More! CSO Computer Service Organization 215-657-6065	370/158 mod 3 Datascenter 5.0 meg MVS Specializing in Remote Job Entry TSO, CICS, and Batch IBM 3800 Laser Printer Very Attractive Rates Contact: Stu Karlevsky (212) 564-3030 Datamor 132 West 31 St. New York, N.Y. 10001
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Earnings Reports

Computer Systems — Software & EDP Services
 Peripherals & Subsystems — Leasing Companies
 Supplies & Accessories — CW Composite Index



COMPUTER INVESTORS GROUP

Three Months Ended Dec. 31

	1978	1977
Shr End	\$1.18
Revenue	9,881,000	\$9,853,000
Earnings	388,000	(1,837,000)
9 Mo Shr	.57
Revenue	25,007,000	22,610,000
Tax Cred	259,000
Earnings	1,242,000	(2,511,000)

COMPUTER PRODUCTS

Year Ended Dec. 29

	1978	1977
Shr End	\$5.51	\$8.44
Revenue	10,578,941	8,008,730
Earnings	1,149,834	895,230

a-Adjusted to reflect 20% stock dividend in November 1978.

DATA PACKAGING

Year Ended Dec. 2

	1978	1977
Shr End	\$1.38	\$1.11
Revenue	30,518,000	23,871,200
Earnings	331,000
Spec Cred	2,228,000	171,000

DATA RESOURCES

Year Ended Dec. 31

	1978	1977
aShr End	\$1.55	\$1.26
Revenue	31,470,700	23,871,200
Earnings	3,148,800	2,544,700
3 Mo Shr	.40	.36
Revenue	8,204,500	6,847,300
Earnings	814,100	734,900

a-Reflects 50% stock dividend payable in March 1979.

MATHEMATICA

Three Months Ended Dec. 31

	1978	1977
Shr End	\$3.03	\$1.14
Revenue	6,164,000	5,854,000
Earnings	24,000	98,000
6 Mo Shr	.09	.29
Revenue	12,106,000	11,283,000
Earnings	48,000	202,000

a-Reflects equity in net loss of affiliate of \$205,000 in the quarter and \$255,000 in the six months.

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 Rio de Janeiro ZC 21
 Phone: 242-7395
 Telex: 212-1507

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 7, 1979

All statistics compiled,
 computed and formatted
 by
 TRADE QUOTES, INC.
 Cambridge, Mass. 02139

E X C H	1978-79 RANGE (1)	-PRICE-			E X C H	1978-79 RANGE (1)	-PRICE-			E X C H	1978-79 RANGE (1)	-PRICE-			E X C H
		CLOSE MAR 7 1979	WEEK NET CHNGE	WEEK PCT CHNGE			CLOSE MAR 7 1979	WEEK NET CHNGE	WEEK PCT CHNGE			CLOSE MAR 7 1979	WEEK NET CHNGE	WEEK PCT CHNGE	
COMPUTER SYSTEMS															
A ANDAML CORP	28-69	38 3/8	+1 3/4	+4.7	O ADVANCED COMP TECH	1-2	7/8	0	0.0	O DATA ACCESS SYSTEMS	3-14	9 3/4	+3/4	+8.3	
N BURROUGHS CORP	59-87	65 1/4	+1/2	+0.7	O ANACOMP INC	8-22	16 7/8	+1	+6.2	O DATA 100	9-20	19 1/2	0	0.0	
O COMPUTER AUTOMATION	15-44	20 1/4	+1 1/4	+6.5	A APPLIED DATA RES.	8-17	11	0	0.0	A DATA PRODUCTS CORP	14-25	19 3/8	+3/8	+1.9	
N CONTROL DATA CORP	23-44	31 5/8	+1 3/8	+4.5	N AUTOMATIC DATA PROC	29-36	29 3/4	+3/4	+2.5	O DATUM INC	2-6	2 3/4	0	0.0	
O CRAY RESEARCH INC	8-33	26 1/2	+3 1/2	+15.2	O COLEMAN AMERICAN COS	1-2	5/8	0	0.0	O DECISION DATA COMPUT	2-6	3 3/8	+1/8	+3.8	
N DATA GENERAL CORP	42-71	60 3/4	+1 3/8	+2.3	C COMPU-SERV NETWORK	5-12	8	0	0.0	O DELTA DATA SYSTEMS	1-1	3/8	-1/8	-25.0	
N DATAPoint CORP	34-75	72 7/8	+3 3/4	+5.4	C COMPUTER HORIZONS	1-9	4 3/4	-1/2	-9.5	A EDUCATION INC	6-34	21 1/2	+5/8	+2.9	
N DIGITAL EQUIPMENT	39-58	50 1/8	+5/8	+1.2	O COMPUTER NETWORK	5-16	6 1/4	+7/8	+10.2	O DATARAM CORP	6-32	13 1/2	-1	-6.8	
N ELECTRONIC ASSOC.	2-13	6 5/8	-1/8	-1.8	N COMPUTER SCIENCES	8-17	10 7/8	+3/8	+3.5	N ELECTRONIC M C M	4-9	4 3/8	0	0.0	
A ELECTRONIC ENGINEER	9-19	11	+1/8	+1.1	C COMPUTER TASK GROUP	1-5	4 1/2	+3/4	+20.0	O FABRI-TEK	1-2	3/4	0	0.0	
N FOUR-PHASE SYSTEMS	19-46	32 1/4	+2 1/2	+8.4	O COMPUTER USAGE	2-4	2 1/2	+1/8	+5.2	O GENERAL COMPUTER SYS	1-3	2 1/4	0	0.0	
N FOXBORO	28-40	30	+1/4	+0.8	C COMPUT AUTO REP SVC	4-10	8 3/8	+1/2	+6.3	O GENERAL DATACOM INC	9-21	15	+1	+7.1	
O GENERAL AUTOMATION	7-26	13 1/4	+1/4	+1.9	C CORSHARE	6-19	19	+2 1/4	+13.4	N HAZELTINE CORP	10-17	13 3/4	-1/8	-0.9	
O IBM COMPUTER CORP	1-3	1 5/8	+3/8	+30.0	O CULLINANE CORP	14-33	20 1/4	+1/2	+2.5	N HARRIS CORP	17-36	26 1/2	+1/2	+1.9	
N HEWLETT-PACKARD CO	62-95	86 3/8	+1 1/4	+1.4	O DATA DIMENSIONS INC	4-9	5 3/8	0	0.0	O INFODREX INC	6-11	8 1/2	+3/4	+9.6	
N HONEYWELL INC	43-76	64	0	0.0	O DATATAB	1-2	2	0	0.0	O INFORMATION INTL INC	7-12	9 3/4	+1/2	+5.4	
N IBM	236-316	304 3/4	+4 3/4	+1.5	N ELECTRONIC DATA SYS.	15-25	19 7/8	+7/8	+4.4	O INFOTON	1-3	2 5/8	+1/4	+10.5	
O MANAGEMENT ASSIST	9-29	20 3/8	+2	+10.8	O INSYTE CORP	1-3	1 1/8	0	0.0	O INTEL CORP	39-62	60	+3 1/2	+6.1	
O MANUFACTURING DATA S	9-23	19 1/2	+5/8	+3.3	O IPS COMPUTER MARKET	2-3	3	0	0.0	A LUNDY ELECTRONICS	4-8	4 3/4	-1/4	-5.0	
O MICRODATA CORP	10-23	19 1/2	+1	+5.4	O KEANE ASSOCIATES	3-6	5	+1/4	+5.2	O MSI DATA CORP	10-19	10 3/4	+1/8	+1.1	
SOFTWARE & EDIT SERVICES															
O MINI-COMPUTER SYST	4-8	4 1/2	-1/4	-5.2	O KEYDATA CORP	1-3	2 3/8	+1/8	+5.5	N MEMOREX	27-59	32	+1 3/8	+4.4	
O MODULAR COMPUTER SYS	7-17	16 3/4	+1/4	+1.5	A LOGICUN	10-19	12 3/4	+1 3/8	+12.0	N MOHAWK DATA SCI	6-15	10 1/8	+1/4	+2.5	
N NCR	37-70	64 5/8	+2 1/2	+4.0	A NATIONAL CSS INC	15-36	30 1/2	+2 7/8	+10.4	O OMEX	2-6	6	0	0.0	
N PRIME COMPUTER INC	20-43	30 1/2	+1 7/8	+6.5	O NATIONAL DATA CORP	7-13	9 1/2	+1/4	+2.7	O PARADYNE CORP	9-17	14 1/4	+1	+7.5	
N PERKIN-ELMER	17-31	29 3/8	+2 1/8	+7.7	A ON LINE SYSTEMS INC	12-30	18 1/4	+1 7/8	+11.4	O PENRIL CORP	5-12	8 5/8	+5/8	+7.8	
N SPERRY RAND	33-49	46 1/8	+7/8	+1.9	N PLANNING RESEARCH	4-10	6 1/4	+1/4	+4.1	N PERTEC CORP	9-17	9 3/8	+1/2	+5.6	
A SYSTEMS ENG. LABS	11-24	14 3/4	+1	+7.2	C PROGRAMMING & SYS	1-1	1	0	0.0	A POTTER INSTRUMENT	2-2	2 3/4	0	0.0	
O TANDEN COMPUTERS INC	13-37	25 1/2	+1 3/4	+7.3	O RAPIDATA INC	3-7	5 3/8	+5/8	+13.1	O QUANTOR CORP	2-5	1 3/4	0	0.0	
A WANG LABS.	12-36	34 1/2	+3 3/8	+10.8	O REYNOLDS & REYNOLD	18-36	30	+1 1/2	+5.2	O RECONITION EQUIP	7-13	7 3/4	+1/4	+3.3	
LEASING COMPANIES															
C BOOTH COURIER CORP	13-21	18 1/4	+1/4	+1.3	O SCIENTIFIC COMPUTERS	3-9	7 7/8	+1/8	+1.7	O SCAN DATA	1-5	2 5/8	0	0.0	
O COMDISCO INC	5-22	21 1/2	+1/4	+1.1	O TYMSHARE INC	18-41	34 1/2	+1 7/8	+5.7	N STORAGE TECHNOLOGY	19-46	32 3/8	+1 1/2	+4.8	
A COMMERCE GROUP CORP	1-3	1/4	0	0.0	A URS SYSTEMS	5-8	6 1/2	0	0.0	O T BAR INC	11-21	20 3/4	+3/4	+3.7	
A COMPUTER INVESTS GRP	1-7	3	-1/8	-4.0	N WYLY CORP	1-7	5	+1/2	+11.1	O TESSATA SYSTEMS CP	9-23	14 1/4	+1/4	+4.4	
O CONTINENTAL INFO SYS	5-15	7 3/4	-1/4	-3.1											
N DATRONIC RENTAL	1-3	3	+3/8	+15.7											
A DCL INC	3-5	3 3/4	0	0.0											
N DPL INC	8-14	10 3/4	+7/8	+8.8											
N ITIL	16-36	22 1/4	+5/8	+2.8											
N LEASCO CORP	24-39	35	+3	+8.3											
O LEASPCORP	1-4	2 3/4	+1/8	+4.7											
A PIONEER TEX CORP	3-7	3 1/8	0	0.0											
N U.S. LEASING	13-20	14	-1/4	-1.7											
PERIPHERALS & SUBSYSTEMS															
C BOOTHTE COURIER CORP	13-21	18 1/4	+1/4	+1.3	N ADDRESSOGRAPH-MULT	14-32	18 7/8	+2 1/4	+13.5	SUPPLIES & ACCESSORIES					
O COMDISCO INC	5-22	21 1/2	+1/4	+1.1	O ADVANCED MEMORY SYS	7-18	13	+3/4	+6.1	A AMERICAN BUS PROD	6-11	9 1/2	+1/2	+5.5	
A COMMERCE GROUP CORP	1-3	1/4	0	0.0	N AMERCOMP CORP	10-19	15 1/2	+7/8	+5.9	O BALTIMORE BUS FURMS	1-4	4 1/2	+1/2	+50.0	
A COMPUTER INVESTS GRP	1-7	3	-1/8	-4.0	O ANDERSON JACOBSON	5-10	7 1/8	+1/4	+3.6	N BAYVIEW WRIGHT	14-34	15 1/2	+5/8	+8.2	
O CONTINENTAL INFO SYS	5-15	7 3/4	-1/4	-3.1	N APPLIED UIG DATA SYS	9-22	9 3/8	-1/4	-2.5	O CYBERNATICS INC	1-1	5/8	0	0.0	
N DATRONIC RENTAL	1-3	3	+3/8	+15.7	O BEEHIVE INT'L	3-7	4 3/8	-1/8	-2.7	O DUPLER PRODUCTS INC	13-30	18 5/8	+3/8	+2.0	
A DCL INC	3-5	3 3/4	0	0.0	A BOLT-BERANEK & NEW	6-14	12 1/4	+1/2	+4.2	N ENNIS BUS. FORMS	8-17	15 1/8	+1/8	+0.8	
N DPL INC	8-14	10 3/4	+7/8	+8.8	N BUNKER-RAND	10-22	21 1/8	+1 5/8	+8.3	N HARRIS WRIGHT	17-36	26 1/2	+1 5/8	+4.4	
N ITIL	16-36	22 1/4	+5/8	+2.8	A CALCOMP	3-13	8 1/4	+3/4	+10.0	O MODRE CORP LTD	24-34	29 3/4	+1/2	+1.7	
N LEASCO CORP	24-39	35	+3	+8.3	O LANG-LOGE MEMORIES	3-9	3 3/4	+1/4	+7.1	N NASHUA CORP	18-37	23 5/8	+1 1/4	+5.5	
O LEASPCORP	1-4	2 3/4	+1/8	+4.7	N CENTRONICS DATA COMP	16-37	34 5/8	+1 7/8	+5.7	O STANDARD REGISTER	20-27	25	+2	+8.6	
A PIONEER TEX CORP	3-7	3 1/8	0	0.0	C COGNITRONICS	1-4	1 5/8	0	0.0	A TAB PRODUCTS CO	8-14	12 1/2	+1/2	+8.6	
N U.S. LEASING	13-20	14	-1/4	-1.7	O COMPUTER COMMUN.	6-10	8 1/4	0	0.0	N UNARCO	19-52	51 1/2	0	0.0	
COMPUTER EQUIPMENT															
O COMPUTER CONSOLES	4-10	9	-3/4	-7.6	O COMPUTER CONSOLES	4-10	9	-3/4	-7.6	A WABASH MAGNETICS	10-22	14 5/8	-1/8	-0.8	
O COMPUTER EQUIPMENT	3-10	6 5/8	-2 1/4	-26.4	O COMPUTER EQUIPMENT	3-10	6 5/8	-2 1/4	-26.4	N WALLACE BUS FORMS	18-33	24 1/4	+5/8	+2.6	
C COMPUTER TRANSCIVER	1-5	3 1/4	-1/8	-3.7	O COMPUTER TRANSCIVER	1-5	3 1/4	-1/8	-3.7						
O COMPUTATION VISION CORP	9-36	35 1/2	+3 1/2	+10.9	C COMPUTATION VISION CORP	9-36	35 1/2	+3 1/2	+10.9						
C COMTEK	9-36	34	+1 1/4	+5.4	C COMTEK	9-36	34	+1 1/4	+5.4						
N COMPAQ CORP	13-26	14 1/2	+5/8	+4.5	N COMPAQ CORP	13-26	14 1/2	+5/8	+4.5						
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID TO NEAREST DOLLAR															

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(PS: Don't miss our position announcements on page 5.)



CA-DYNAM/D CA-DYNAM/T CA-DYNAM/FI

<div style="text-align: right;">CW 3/12</div> <h3>COMPUTER ASSOCIATES</h3>	
<p>YES! I'd like more details as indicated.</p> <p>Name _____</p> <p>Title _____</p> <p>Company _____</p> <p>Address _____</p> <p>City _____ State _____ Zip _____</p> <p>Phone _____ CPU _____ OP/SYS _____</p>	
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